ABSTRACT

Title of Thesis: PREDICTION OF AIR POLLUTANT FROM POULTRY HOUSES BY A MODIFIED GAUSSIAN PLUME MODEL

Zijiang Yang, Master of Science, 2017

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Concentrated animal feeding operations release a variety of potential pollutants, such as ammonia and particulate matters (PM). Field measurements are time consuming, costly, and only provide a limited amount of spatial and temporal information. Air dispersion models can serve as an alternative solution, especially if coupled with field sampling. The Gaussian plume model (GPM) is a mathematical model that assumes steady state condition. Previous studies have used the GPM to evaluate and analyze source. However, much less is known about utilizing GPM to simulate plumes from horizontal sources, such as the exhaust fans from poultry houses. The purpose of this study is to modify and validate a GPM to predict air pollutant emissions from the poultry houses. Two major assumptions were applied on the model, 1) a virtual releasing point was proposed behind the ventilation fan, and 2) ventilation fan was considered as the dominant wind direction in the model for short distance (< 50 m). The modified model was validated with field experimental data. Performance and sensitivity of the model were also evaluated. Fraction of predictions within a factor of two of observations (*FAC2*) of NH_3 and PM were 0.609 and 0.625. Model-predicted concentrations of NH_3 were 1.5 times of the measured values on average. Model-predicted concentrations of PM was 0.98 times of the observed values on average.

PREDICTION OF AIR POLLUTANT FROM POULTRY HOUSES BY A MODIFIED GAUSSIAN PLUME MODEL

by

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Dedication

I would like to thank for my parents. They supported and encouraged me to study in the U.S., I can clearly remember five years ago when they asked me if I wanted to study in the U.S.; it seemed impossible at that time !. I would also like to thank my roommates, Crystal, Henry, Wenwen, Mary, Panpan, Wei and Ruirui. I especially appreciate Crystal always listening; she encourages and inspires me when I feel depressed, although I did for her is more than she did for me, haha !. Also thanks to Qi and Victor. It is awesome to have friends who like eating! I will miss you both when you graduate and move on !. Finally, I would like to thank Lihong, she introduced me to Matlab six years ago, since then I have been interested in using Matlab to solve math problems in everyday life.

And finally, thank you, Siru.

幸(しあわ)せ. さようなら.

以上(いじょう)です.

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I would like to thank for my advisor, Dr. Alba Torrents, she provided me the chance to transfer from structure to the “chemistry-based” environmental program and to work in the chemistry lab. I am also grateful to be able to continue towards, a Ph.D., such education will certainty change my life track! Although I missed my home very much, the learning and working environment and my challenges in understanding the environment as a chemist made me forget about home. I have never thought I would be an applied chemistry PhD student after I had a very very bad scores in “Chinese National Higher Education Entrance Examination”. When I was in middle school, I wanted to be a chemistry scientist, and now it seems like this ambition is going to come true! I am also grateful for the challenge to work with interdisciplinary problems, which is very interesting and challenging for me. I am also very grateful to my co-advisor at ARS-USDA, Dr. Hapeman, she opened her labs to me and is always ready for challenging discussions; for encouraging my ideas and her very useful advice both in the scientific and linguistic aspects. Thanks for my committee members, Dr. Alba Torrents, Dr. Cathleen J. Hapeman and Dr. Birthe V Kjellerup for taking time for reviewing and analyzing my work. Many thanks to Qi Yao, for discussing and playing a critical role in giving me so many helps during the whole period. Thanks for Dr. Michael D. Buser, for discussing and criticizing, which made the model more powerful and enhanced my understanding of the whole process. Thanks for Dr. Alfieri Joe, for providing the original code and many helps on meteorological problems. Thanks for Dr. Chen Guang, for giving me many suggestions about fluid mechanics. Thanks for Liu Heng, for helping me with

ANSYS to simulate and visualize fluid flow. Thanks for Collin Craige, for providing much help on Matlab coding.

皆(みな)さん, ありがとうございました！(Thank you very very very much!)

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Chapter 1: Introduction

U.S. chicken industry

The United States has the largest broiler chicken industry in the world with about 19% of its production exported worldwide [1]. This also makes chicken industry a very important part of U.S. economy. With an increase demand of poultry products, the high concentrated feeding poultry industry is expanding. The number of workers directly employed is about 280,800, and the number of workers indirectly employed is about 1,339,900 [1]. The top five states that produce broiler are Alabama, Arkansas, Delaware, Florida and Georgia [2], which are all located at the East of the U.S.

With such an expansion, there is an increased concern about atmospheric emissions [3] [4], related to increasing environmental risks and harm to public health [7]. With an increase population and sprawling, chicken farms are getting closer to where people live increasing environmental and health concerns [5]. According to a report from National Public Radio (NPR), most people in the chicken farm expanding region are considering this as a potential health hazard [5]. The residents also reported that they could feel the odors smelling like ammonia and something like dead rotting meat. They were complaining about particle dust that made it hard to breathe, and mentioned that “at night with flashlight, you can see the particles in the yard.” [5].

Pollutants from poultry houses

Pollutants that are discharged from poultry houses included particulate matter (PM), ammonia (NH_3) and volatile organic carbons (VOCs). The odors from broiler chicken houses consisted of several different chemical species, which were generated from decomposition of organic matters [6].

Particulate matter (PM) and ammonia (NH_3) are the primary air pollutants emitted from the poultry houses [8]. The sources of NH_3 were manures and animal themselves. Ammonia (NH_3) did not only have bad smells that impacted the residents living near the farm, but also caused negative impacts to the environment. NH_3 emissions have been shown to change pH and nitrogen (N) compounds distributions in soil near the source. Some research has shown that increased N deposition could increase vegetation and increase the soil carbon pool in a long-term scale, which could change the composition of plant species in the affected area [9]. Other research illustrated a significant negative relationship between N deposition and species richness in prairie grassland [9]. NH_3 can form PM in the atmosphere; known as secondary PM [10].

PM also had negative impacts on the environment. PM was classified into PM2.5, PM10 and total suspended particulate (TSP). PM2.5 referred to the particulates with diameter less than 2.5 μm, while PM10 referred to the particulate matters that had a diameter less than 10 μm. PM from animal houses had larger ratio of organic content, and the main composition of PM that from livestock houses were originated from feed, manure, bedding, skin, feathers and hair [11]. It was reported that small soft and fluffy particles dominated in both fine and coarse PM [12]. It has been reported that PM can coat vegetation leaves, which can cause abrasion, radiative heating, and possible photosynthesis reduction [13]. Additional foliage injury could occur if the PM contained acidic, alkaline, or other toxic materials [13]. PM can impact visibility and be harmful to human health. An estimated 2.1 million people died in the world annually because of fine PM [14]. PM with an aerodynamic equivalent diameter less than 10 μm have been associated with most human health effects because of its ability to penetrate into the respiratory system [15]. Viruses and organic compounds can be attached to PM and released into human body if the PM is inhaled. Adverse health effects associated with PM included pre-mature death, asthma attack, chronic bronchitis, cancer cardiovascular disease, and diabetes [14].

Therefore, there was a need to mitigate air exhaust from chicken house.

Air dispersion models

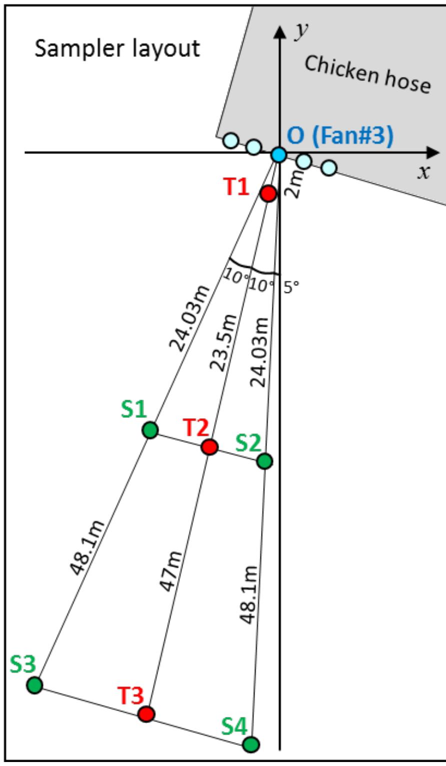
Dispersion models are commonly used to simulate air pollutant dispersion. The models are generally classified as steady-state or dynamic models.

Steady-state model assumed that the dispersion processes were in steady-state during a given period. The Gaussian plume model (GPM) is a steady state model that assumes that the pollutant dispersion follows Gaussian distribution. GPM is relatively simple, and requires less input data than dynamic models GPM is relatively simple, and requires less input data than dynamic models. GPM has been widely applied to estimate the effect of regular or instantaneous emissions and inversely estimate source strength [16] [17]. GPM has been widely used for agricultural operations on various spatial scales. In the scale of 100 km, the Gaussian plume model was used to describe ammonia and ammonium (collectively termed NH_x) deposition in the natural surrounding area of a farmland [18]. In a smaller scale studies (50 – 100 m), an inverse Gaussian plume model was used to estimate NH_3 emission factors for livestock farm and ventilated poultry house operations [20].

The American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) is an advanced steady-state model based on GPM and developed by United States Environmental Protection Agency (EPA). AERMOD is most commonly used to predict the pollutant concentration patterns for emissions released from industrial stacks has and has been used worldwide [21] [22] [23]. AERMOD has been applied to predict the behavior of PM discharged from poultry houses [24].

Dynamic models, such as the computational fluid dynamic (CFD) model, are based on aerodynamic and fluid dynamics. CFD models can effectively handle situations including isolated buildings, single street canyons, building arrays, continuous street canyons, and building complexes [25]. Some applications have also been done by using CFD modeling in the field of agriculture. CFD approach has been used increasingly to study airborne pollutant dispersions considering the influence of buildings [26 In the application of smaller spatial scales, CFD models have been used to evaluate how windbreaks impact localized wind field patterns [26] [27]. Another dynamic method used to solve fluid mechanic equations to simulate fluid movement is finite element method (FEM). FEM models can simulate whole diurnal cycles that directly apply to more realistic scenarios [28]. Researchers have built up FEM methods to more accurately and efficiently solve problems with convection-dominated conditions [29].

Information in the literature on using steady state or dynamic air-pollutant dispersion models for the pollutants emitted from poultry-house ventilation fans is limited. Therefore, the purpose of this project was to evaluate the GPM and determine how well this model could predict PM concentrations, measured by an array of PM samplers, emitted from a poultry-house, small-scale, ventilation fans. Further, this project will explore a few modifications to improve the models performance for the given data sets.



	A1-2	A2-2	B1-2	B2-2	C1-2	C2-2	D1-2	D2-2
T1-1	√		√		√		√	
T1-2	√		√		√			
T1-3	√		√					
T1-4	√							
T2-1	√	√	√	√	√	√	√	√
T2-2	√	√	√	√	√	√		
T2-3	√	√	√	√				
T2-4	√	√						
T3-1	√	√	√	√	√	√	√	√
T3-2	√	√	√	√	√	√		
T3-3	√	√	√	√				
T3-4	√	√						
S1	√	√	√	√	√	√	√	√
S2	√	√	√	√	√	√	√	√
S3	√	√	√	√	√	√	√	√
S4	√	√	√	√	√	√	√	√

Figure 1. Sample layout and different wind speed scenario (WSS). Sampler layout is on the left and different wind speed scenario is on the right. T1 was 2 m away from the fan; S1, T2 and S2 were about 20 m away from the fan; S3, T3 and S4 were about 50 m away from the fan. T1, T2 and T3 all have 4 samplers along different heights of 2 m, 4.5 m, 7.25 m and 10 m. S1, S2, S3 and S4 samplers are all of 2m height. The positive direction of *y*-axis was north, and the middle fan (fan#3) was at the origin of the coordinate system. Scenario numbers: A1-2: use all samplers; A2-2: all samplers except T1 samplers; B1-2: all samplers except 10 m samplers; B2-2: all samplers except 10 m and T1 samplers; C1-2: 2 m and 4.5 m samplers; C2-2: 2 m and 4.5 m samplers except T1 samplers; D1-2: 2m samplers; D2-2: 2 m samplers except T1 samplers.

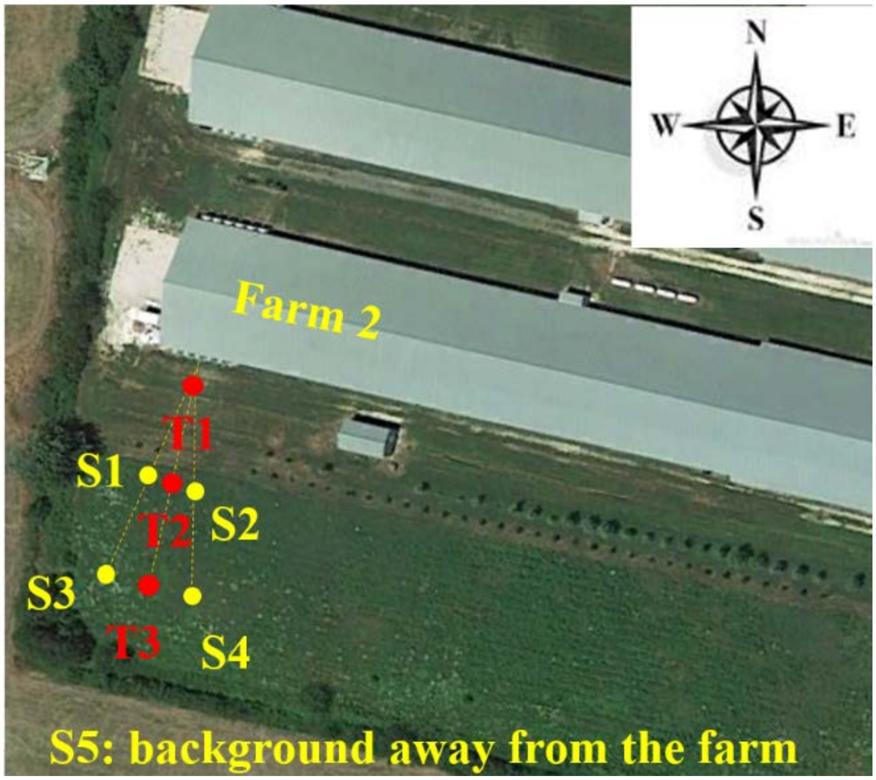


Figure 2. Map and sampler distribution of Farm in map.

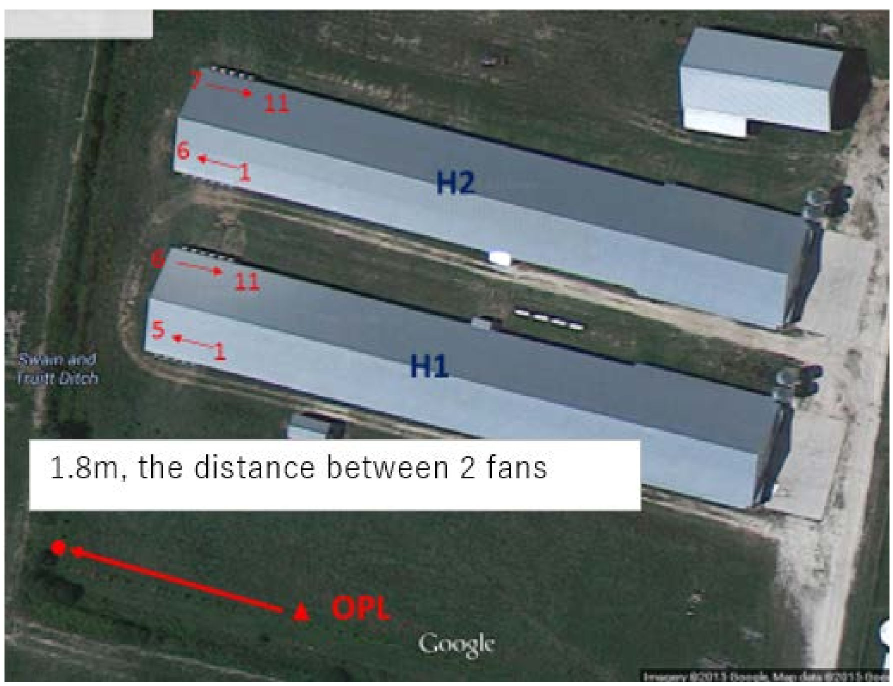


Figure 3. Fan number and house number of Farm.

Chapter 2: Problem Description and Model Determination

Site description

The experiment was conducted at a chicken farm in Delaware. Sampling period was from May 17th to 25th, 2015. There were 28,000 chicken per house during the sampling period. Sampler layout was demonstrated in **Figure 1. Figure 2** displayed the on-site image of the sampling farms and **Figure 3** demonstrated fan number and house number. This farm was a typical CAFO broiler farm with two houses. Each house contains approximately 28,000 chicken per flock with the dimensions of 122 m * 21 m (400 ft * 70 ft) and located in Delaware. Each flock was raised for 60 days with a 10-day inactive time between flocks. Mechanical ventilation of the broiler house was accomplished by the five 48-inch tunnel fans and one 36-inch side fan on both sides of the house. Sampling details can be found in another research [30] [31].

Model selection

AERMOD was a commercially available model formulated and recommended by EPA [32]. The input data requirement was common meteorological observation, and it was able to deal with problems with complex territory. However, AERMOD was originally designed to solve industrial problems, especially plume from stacks, making it hard to deal with problem of active discharge in horizontal direction. CFD model was more accurate, but it required considerable amount of input data, such as geometry of buildings and territory information. Many extra assumptions were also required when building up the model, and these simplifications might increase error.

GPM was a reliable tool to handle small scale problem [33]. It was simple and the input data was also common meteorological observations. The limitation of GPM was that it was not able to deal with complex territory.

Selection of an ideal model was based on their suitability to represent the emission from poultry farms, experimental data requirement for validation, and simplicity. Since there were no territory or buildings in the domain, and field measurement could provide on-site common meteorological observations, GPM fitted this problem well. Inverse Gaussian plume model has been applied to estimate source emission and characterize NH_3 plumes from chicken houses, and the closest sampling point was 14 m from releasing source [33]. Therefore, GPM was selected to predict the concentration of NH_3 and PM from chicken house.

Mathematics of GPM

GPM was under critical assumptions, including: (1) steady-state conditions, which imply that the rate of emission from the point source is constant; (2) homogeneous flow, which implies that the wind speed is constant both in time and with height (wind direction shear is not considered); (3) pollutant is conservative and no gravity fallout; (4) perfect reflection of the plume at the underlying surface, i.e. no ground absorption; (5) the turbulent diffusion in the *x*-direction is neglected relative to advection in the transport direction, which implies that the model should be applied for average wind speeds of more than 1 m/s; (6) the terrain underlying the plume is flat; (7) all variables are ensemble averaged, which implies long-term averaging with stationary conditions.

The following equation was the mathematical form of Gaussian plume model:

$$C(x,y,z) = \frac{Q}{2\pi\sigma_y\sigma_z u}\exp\left(\frac{-y^2}{2\sigma_y{}^2}\right)\left[\exp\left(\frac{-(z+h)^2}{2\sigma_z{}^2}\right)+\exp\left(\frac{-(z-h)^2}{2\sigma_z{}^2}\right)\right] \quad \text{(Eq. 1)}$$

where x, y and z were the downwind crosswind and vertical coordinates, and h was releasing height from the ground. Q was source strength, u was wind speed. σ_y and σ_z were the standard deviation of the distribution concentration in y and z axis, and they were related to meteorological condition. Term $\exp\left(\frac{-(z+h)^2}{2\sigma_z{}^2}\right)$ refers to the reflection from the ground.

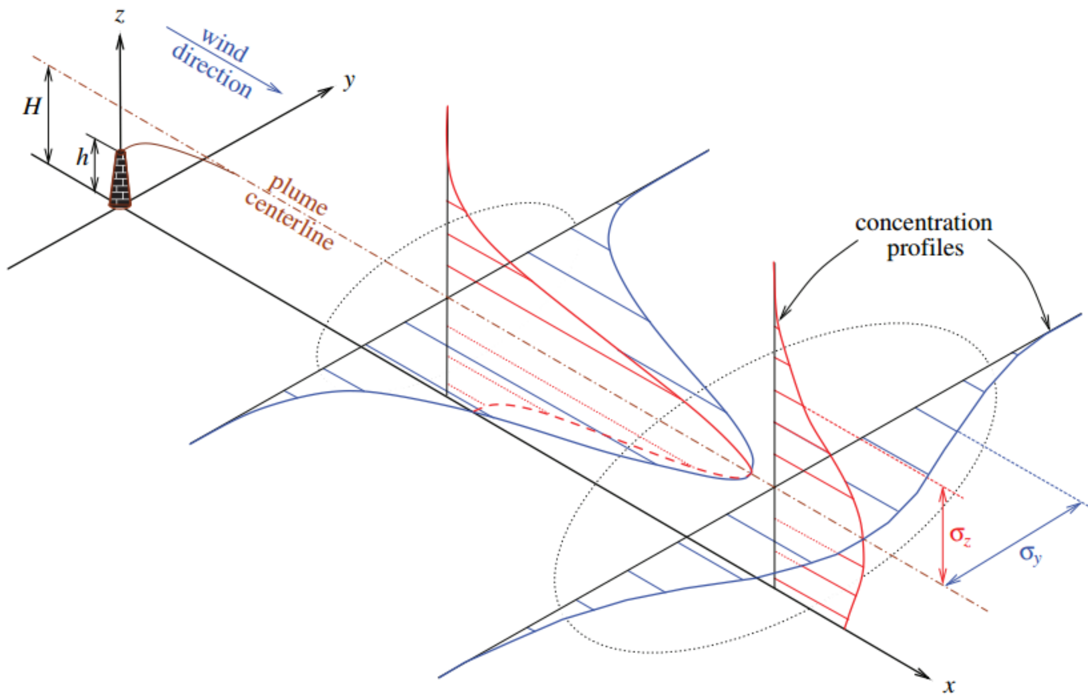


Figure 4. Illustration of Gaussian plume model. A contaminant plume emitted from a continuous point source, with wind direction aligned with the x-axis. Profiles of concentration are given at two downwind locations (vertical in red, horizontal in blue) and the Gaussian shape of the plume cross-sections are shown relative to the plume centerline [36].

Chapter 3: Assumptions and Model Modifications

According to the problem description, this study was different from previous applications in two main aspects: (1) Horizontal releasing source: the emission source was horizontal. (2).Strong localized wind flow: most of the wind was controlled by the ventilation fan, overriding the ambient wind conditions. (3) Small spatial scale: the fan, as the source of the pollutants, is in close proximity to the sampling system. Our first sampling port was only 2 meters away from the house and the fan has a diameter of 1.2 m, thus the size of the fan should be taken into consideration

Assumptions

Because the cross-sectional area of the ventilation fans were about 0.13 m^2, virtual pollutant release points were assumed to be directly behind each ventilation fan. The distance between the fan and its corresponding virtual point was defined as L. The direction of airflow produced by the fan was normal to the surface of the fan, and defined as fan direction. The geometry of virtual point and its corresponding fan was demonstrated in **Figure 5**, and geometry of the fan was shown in **Figure 6**. The height of the virtual point was equal to the distance between the center of the fan and the ground (1.2m). This assumption compensated the defect to consider the ventilation fan as a point source.

Over the short distance between the ventilation fans and the sampling points, the airflow produced by the ventilation fans overwhelmed the much weaker ambient winds. Background wind rose was shown in **Figure 7**, and the summary of background average wind speed and calm condition was shown in **Figure 8**.

Therefore, the direction of the airflow produced by the fans, 215 degrees from true North based on building geometry, was used in the GPM instead of ambient wind direction.

It was assumed that both PM and NH_3 behaved as conservative pollutants with no transformation nor deposition. This experiment was at a small scale (< 50m), and wind speed was pretty large near the fan. Therefore, the retention time was negligible for pollutant interactions and deposition. This assumption has been accepted in previous studies [19] [34].

It was assumed that each receptor point concentration was composed of pollutants emitted from each of the five ventilation fans, according to the superposition principle [34] [35]. Therefore, GPM was run for each individual ventilation fan to determine each fans contributions to specific receptor point concentration. Then these concentrations for a given receptor point were summed to produce a total receptor point concertation.

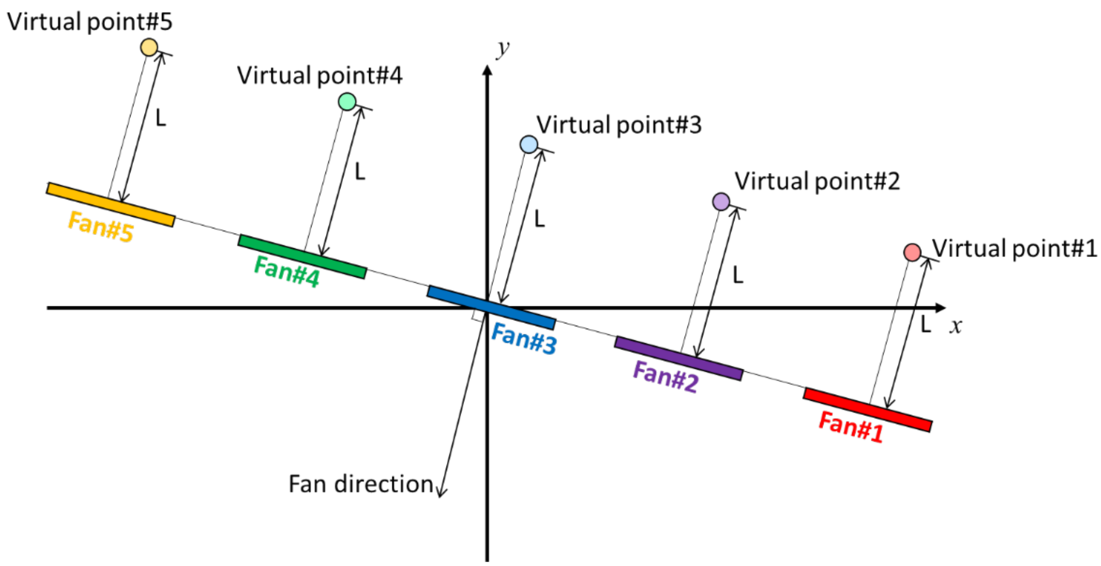


Figure 5. Geometry of *L*, virtual point and fan direction. There were five fans in total, and for each fan, there was a virtual point behind it. Fan direction was the direction of normal of the fan surface. The distance between each fan is 1.8 m, and the diameter of each fan is 1.2 m.

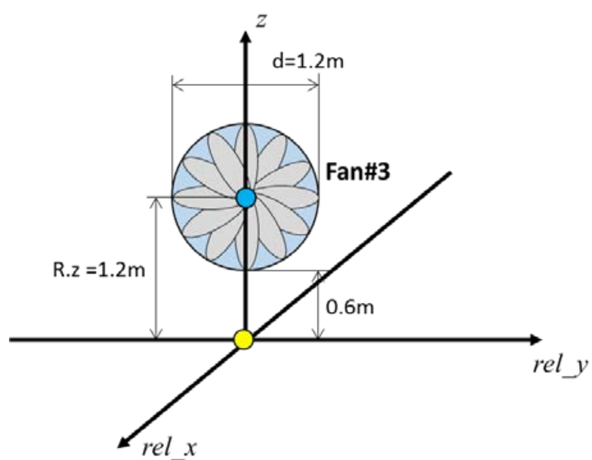


Figure 6. Geometry of fan. The diameter of each fan is 1.2 m; the height of center is 1.2 m; the height of bottom is 0.6 m.

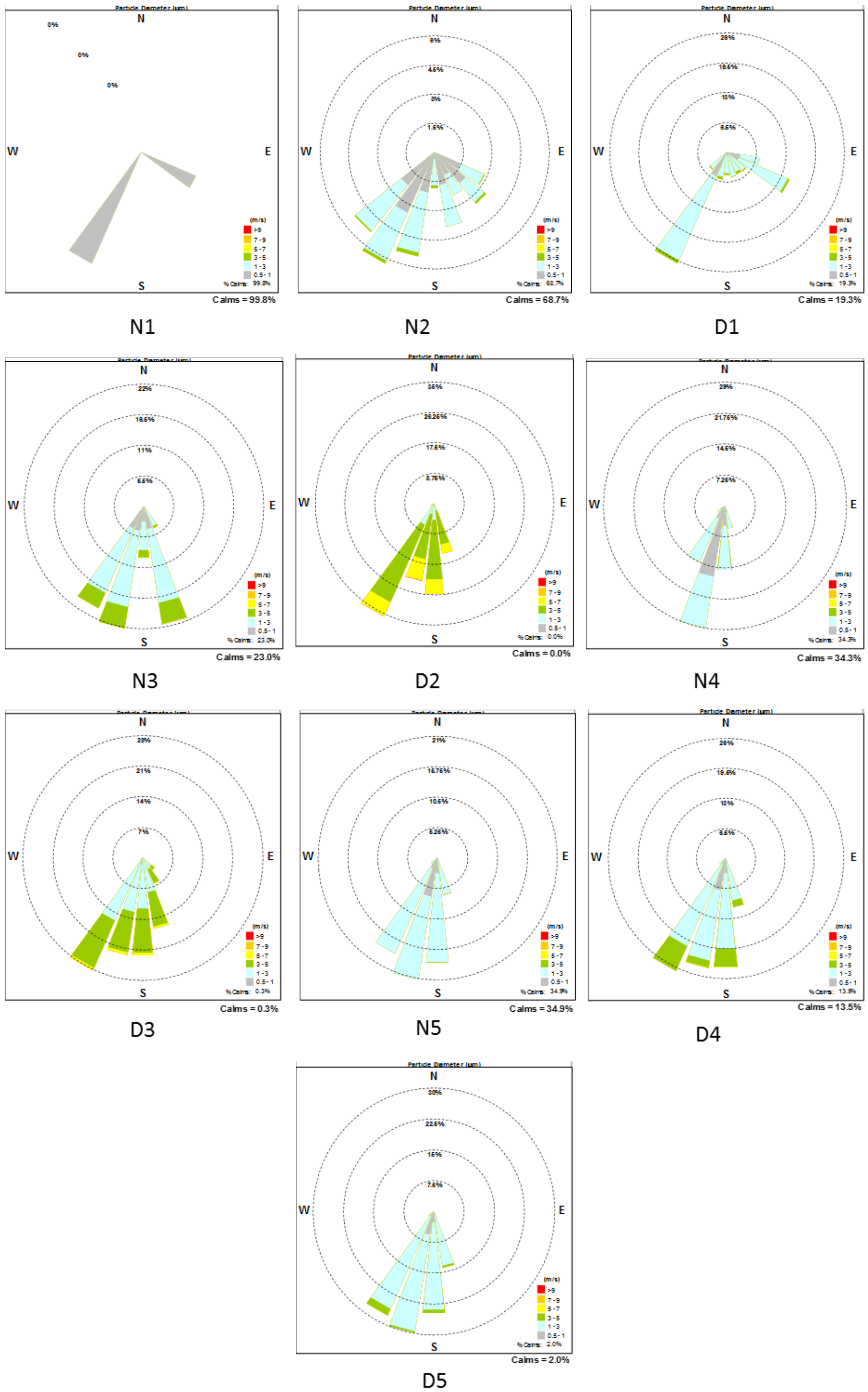


Figure 7. Background wind roses of the experiment. %Calm referred to the percentage of the wind speed condition lower than 0.5 m/s during sampling period, which was the detection limit of the anemometer.

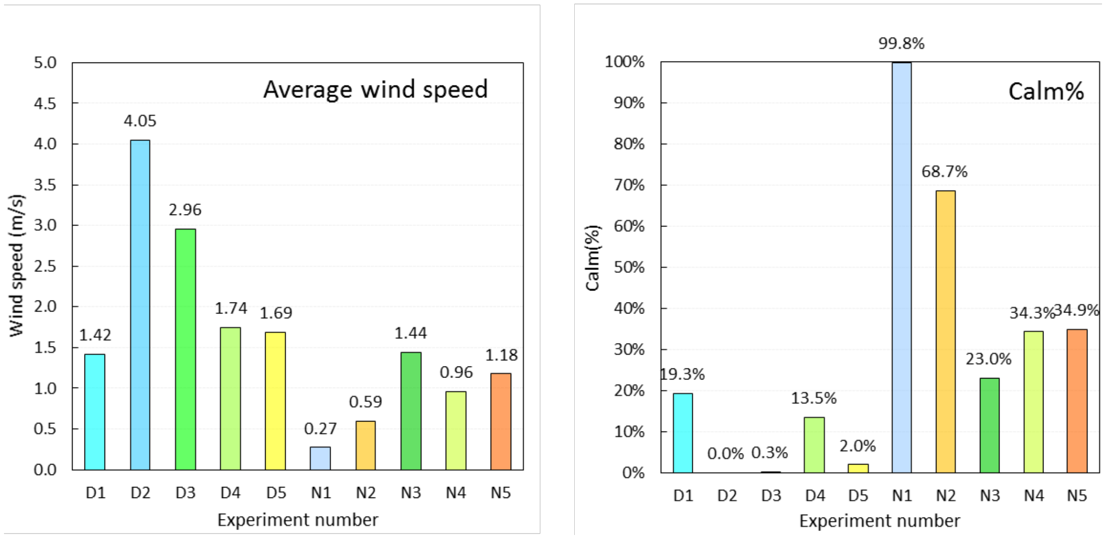


Figure 8. Summary of background average wind speed and calm condition. Average wind speed refers to average wind speed of all samplers in each experiment duration. Cam% refers to the percentage of calm conditions.

<u>Processes of the model</u>

Meteorological input, fan factor and coordinates of samplers were three main input parameters of the model. They were all experimentally obtainable. Optimal *L* was another critical input and obtained by running the model with different *L* values. The determination of optimal *L* would be discussed in the following section. Then these inputs were processed by GPM, and the output was a concentration ratio. The concentration ratio together with observed concentration was used to obtain model predicted concentration. Overview of the model data flow was shown in **Figure 9**.

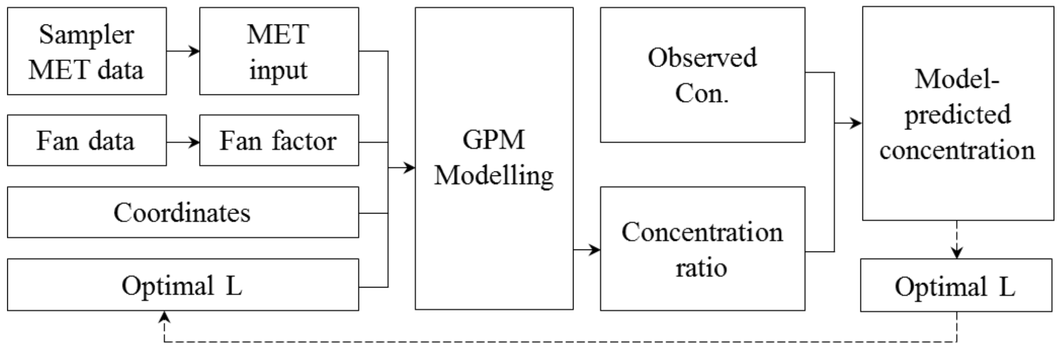


Figure 9. Flow chart of the model process. Arrows were data flow when processing the model. The first running of the model was to determine the optimal L, and then the second running of the model based on determined optimal L as input was to calculate model-predicted concentration.

Meteorological input was calculated by hourly averaging on-site observation of each sampler, including wind speed, temperature, relative humidity, and atmospheric pressure, partial pressure of air and partial pressure of water vapor. Some other meteorological input, including density of water vapor, sensible heat flux, and friction velocity, were derived. The original data were from all samplers in the domain except T1-4, since it had electronic problems **(Appendix A)**. In order to compare the sensitivity of the model, different sampler combinations were tested to evaluate the performance of the model under difference wind speed scenarios **(Figure 1)**. Fan factor was the ratio of the time when the fan was on over the whole duration of the experiment. Coordinates were the position of each sampler in the coordinate system. In the coordinate system, the positive *x*-axis direction was the East; the positive *y*-axis direction was the North; *z*-axis was the height from the ground, and the origin of the coordinate system was the middle fan. The detailed information was demonstrated in **Figure 1, Figure 5 and Figure 6.**

The Gaussian plume model and all parameters were based on the previous work [37]. According to assumptions, fan direction was used instead of ambient wind direction. An additional term, L, was added as the distance between virtual point and its corresponding fan, ranging from 0 m to 34.6 m, with an interval of 0.6 m. 0.6 m was the radius of the exhaust fan **(Additional description for model modification can be found in Appendix B)**.

Since source strength was not measured in the experiment, we assumed source strength $Q = 1$. Therefore, the output was the concentrations when $Q = 1$, we defined this concentration as primary model-predicted concentration (PMp).

Define Sn referred to the number of samplers, so the concentration of a sampler contributed by fan i is noted as $C_{Sn|i}^{PMp|Q=1}$, $PMp|Q = 1$ referred to primary model-predicted concentration, then the total concentration of a sampler when $Q = 1$ could be expressed as:

$$C_{Sn}^{PMp|Q=1} = \sum_{1}^{i=5} C_{Sn|i}^{PMp|Q=1} \qquad (\text{Eq. } 2)$$

T1-1 was 2m away from the fan, and its height was 2m. Therefore, we assumed that the concentration of T 1-1 was independent from the ambient. Thus, T1-1 could be a link between model-predicted concentration and observed concentration. T1-1 was defined as the reference point. For model predictions, we defined:

$$\begin{cases} C_{\mathrm{T1-1}}^{PMp|Q=1} = a \\ C_{Sn}^{PMp|Q=1} = b_{Sn} \end{cases} \qquad (\text{Eq. } 3.1) \qquad\qquad \begin{cases} C_{\mathrm{T1-1}}^{SMp|Q=R} = A \\ C_{Sn}^{SMp|Q=R} = B_{Sn} \end{cases} \qquad (\text{Eq. } 3.2)$$

$C_{\mathrm{T1-1}}^{Mp|Q=1}$ was the primary model-predicted concentration of T1-1 as reference point when $Q = 1$; $C_{Sn}^{PMp|Q=1}$ was the primary model-predicted concentration of any sampler point Sn when $Q = 1$; $C_{\mathrm{T1-1}}^{SMp|Q=R}$ was to the secondary model-predicted concentration (SMp) of T1-1 as reference point when $Q =$ real source strength;

$C_{Sn}^{SMp|Q=R}$ was to the secondary model-predicted concentration of any sampler Sn when source strength equaled to real source strength.

For observed concentrations, we defined:

$$\begin{cases} C_{\mathrm{bg}} = m & \text{(Eq. 4)} \\ C_{Sn}^{Obs} = j_{Sn} & \text{(Eq.5)} \end{cases}$$

C_{bg} was to observed background concentration; C_{Sn}^{Obs} was to observed concentration of sampler Sn, and therefore the observed concentration of reference point T1-1 was j_{T1-1}. We defined a concentration ratio as the model-predicted concentration of a sampler over model-predicted concentration of reference point T1-1:

$$\frac{b_{Sn}}{a} = \frac{B_{Sn}}{A} = k_{Sn} \qquad \text{(Eq. 6)}$$

k_{Sn} was to the concentration ratio of sampler *Sn*. According to (Eq. 1), under the same meteorological condition, the concentration ratio was unique. For reference point, observed concentration equaled to model-predicted concentration plus background concentration:

$$C_{\mathrm{T1-1}}^{Obs} = C_{\mathrm{T1-1}}^{SMp|Q=R} + C_{bg} \qquad \text{(Eq. 7.1)}$$

$$\Rightarrow j_{\mathrm{T1-1}} = A + m \qquad \text{(Eq. 7.2)}$$

$$\Rightarrow A = j_{\mathrm{T1-1}} - m \qquad \text{(Eq. 7.3)}$$

And plugged (Eq. 7.3) into (Eq. 6), there was:

$$\frac{B_{Sn}}{A} = k_{Sn} \qquad \text{(Eq. 8.1)}$$

$$\Rightarrow B_{Sn} = A \cdot k_{Sn} = (j_{\mathrm{T1-1}} - m) \cdot k_{Sn} \qquad \text{(Eq. 8.2)}$$

Then, we defined model-predicted concentration (Mp) of a sampler *Sn* as $C_{Sn}^{Mp|Q=R}$:

$$C_{Sn}^{Mp|Q=R} = C_{Sn}^{SMp|Q=R} + C_{bg} \qquad \text{(Eq. 9.1)}$$

$$\Rightarrow C_{Sn}^{Mp|Q=R} = B_{Sn} + m \qquad \text{(Eq. 9.2)}$$

Then, we combined (Eq. 9.2) with (Eq. 8.2), we had:

$$C_{Sn}^{Mp|Q=R} = (j_{\mathrm{T1-1}} - m) \cdot k_{Sn} + m \qquad \text{(Eq. 10.1)}$$

$$\Leftrightarrow C_{Sn}^{Mp|Q=R} = (j_{\mathrm{T1-1}} - m) \cdot \frac{b_{Sn}}{a} + m \qquad \text{(Eq. 10.2)}$$

$$\Leftrightarrow C_{Sn}^{Mp|Q=R} = \frac{b_{Sn}}{a} \cdot j_{\mathrm{T1-1}} + \left(1 - \frac{b_{Sn}}{a}\right) \cdot m \qquad \text{(Eq. 10.3)}$$

$$\Leftrightarrow C_{Sn}^{Mp|Q=R} = \frac{b_{Sn}}{a} \cdot j_{\mathrm{T1-1}} + \frac{a - b_{Sn}}{a} \cdot m \qquad \text{(Eq. 10.4)}$$

$$\Leftrightarrow C_{Sn}^{Mp|Q=R} = \frac{C_{Sn}^{PMp|Q=1}}{C_{\mathrm{T1-1}}^{PMp|Q=1}} \cdot C_{\mathrm{T1-1}}^{Obs} + \frac{C_{\mathrm{T1-1}}^{PMp|Q=1} - C_{Sn}^{PMp|Q=1}}{C_{\mathrm{T1-1}}^{PMp|Q=1}} \cdot C_{bg} \qquad \text{(Eq. 10.5)}$$

Therefore, the model-predicted concentration of each sampler could be calculated by observed concentration of the reference point (sampler T1-1), primary model-predicted concentration and observed background concentration **(Appendix B)**.

Fraction of predictions within a factor of two of observations (*FAC2*) was used to evaluate the performance of the model. This evaluation method was widely used in previous studies, and it was discussed in a review literature [37]. In this case, it could be expressed as:

$$FAC2 = \text{fraction of data that satisfy: } 0.5 \leq \frac{\mathrm{C}_{Sn}^{\mathrm{Mp}}}{\mathrm{C}_{Sn}^{\mathrm{Obs}}} \leq 2.0 \qquad \text{(Eq. 11)}$$

This equation indicates that the larger *FAC2* the closer our model represents the field experimental data; thus refers to better model. Based on a previous study, a *FAC2* >

0.5 was considered as acceptable [38] [39]. After obtaining *FAC2* for NH_3 and PM using different *L* values, the average *FAC2* for NH_3 and PM was calculated. The optimal *L* should meet with two criterions: (1) optimal *L* was the *L* that generates the maximum average *FAC2* for NH_3 and PM, and (2) *FAC2* for $NH_3 > 0.5$, and *FAC2* for PM > 0.5.

By having determined an optimal *L*, the model was re-processed by using optimal *L* as input. The model-predicted pollutant concentrations were the final model output.

Chapter 4: Results and Discussion

Optimal L

Figure 10 showed the plot of *FAC2* along different *L* values of both NH_3 and PM, and their average values. *FAC2* increased with increasing *L* at beginning, but after a plateau, *FAC2* went down. By applying the criterions mentioned before, the potential optimal *L* was narrowed down to $5.4 \text{ m} \leqslant L \leqslant 8.4 \text{ m}$, because within this range all *L* values showed good performance. In this case, $L = 6.6$ m was decided the optimal *L*, giving *FAC2* of NH_3 equaled to 0.61 and *FAC2* of PM equaled to 0.63.

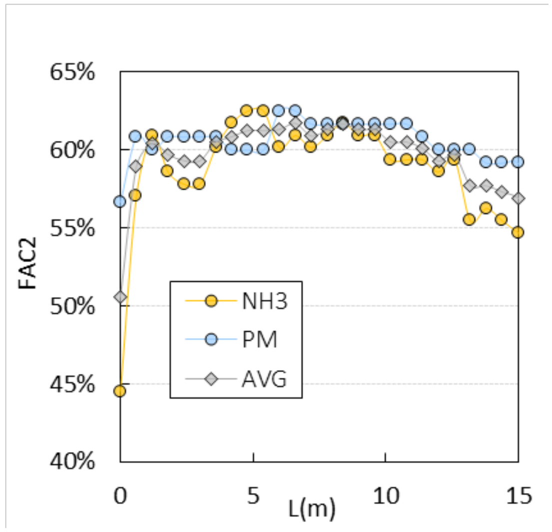


Figure 10. *FAC2* of NH_3, PM and the average along different *L* (40m scale). AVG refers to the average values of *FAC2* of NH_3 and *FAC2* of PM. *L* refers to the distance between virtual point and the fan.

Optimal *L* was a function of fan parameters, mainly including size and power of the fan. Larger fan diameter corresponded to larger optimal *L*, because longer distance was required for the plume to expand to the length of the fan diameter. A more powerful fan also raised optimal *L* value due to increased outflow wind speed. The greater outflow wind speed narrowed the plume size by decreasing dispersion. Longer distance was required to spread out to reach the size of the fan diameter. Therefore, one optimal *L* only matched up with a certain fan under certain working state. In this study, *L* = 6.6 m was chosen as the optimal *L* to this specific fan. Property of the pollutant and weather condition might also play a role by affecting dispersion.

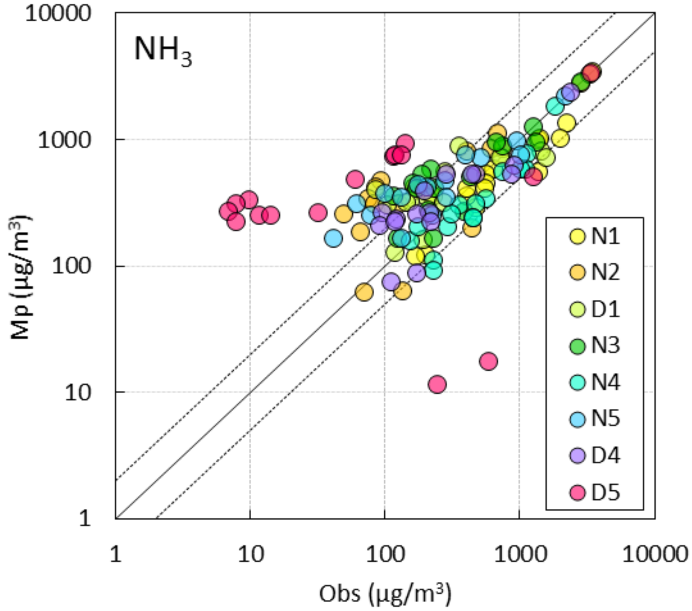
In **Figure 10**, *FAC2* was plotted as a function of *L*. Optimal *L* was chosen when average *FAC2* value was the highest (**full plot of *L* see Appendix C**). The trend of this plot indicated the geometry relation between plume and fan. With *L* increasing, the cross-sectional area of the plume at the fan expanded, approaching the fan size, and when *L* further increased, the cross-section continued expanding and became larger than the area of fan. As a result, the performance (*FAC2*) of the model increased with *L* increasing and after a peak, it dropped down.

Non-reflection results of *FAC2* were also calculated **(Table 1)**. The results showed that *FAC2* of reflection and non-reflection were significantly different **(Appendix D)**, and *FAC2* values of reflection scenarios was higher than non-reflection ones. Partial reflection occurred when NH_3 and PM reached the ground. Reflectivity should be between zero and one. Full reflection (reflectivity = 1) and non-reflection (reflectivity = 0) were two extreme situations for simplicity reasons. In this study, full reflection had better performance than non-reflection, which suggested that the reflectivity was closer to one. Reflectivity was related to the properties of adsorption between ground and pollutants. A grassy ground had greater adsorption capability due to its larger surface area and local humidity. However, the large wind speed from the fan mitigated adsorption by reducing retention time. Wind influence dominated in this case.

Table 1. *FAC2* of NH_3 and PM. R was to reflection, NR was non-reflection.

	20m scale				40m scale			
L(m)	NH_3-R	PM-R	NH_3-NR	PM-NR	NH_3-R	PM-R	NH_3-NR	PM-NR
0	0.51	0.65	0.49	0.60	0.45	0.57	0.52	0.56
0.6	0.64	0.65	0.56	0.60	0.57	0.61	0.59	0.59
1.2	0.69	0.63	0.51	0.57	0.61	0.60	0.56	0.58
1.8	0.66	0.63	0.49	0.57	0.59	0.61	0.55	0.58
2.4	0.65	0.63	0.49	0.56	0.58	0.61	0.55	0.57
3	0.66	0.63	0.50	0.54	0.58	0.61	0.56	0.57
3.6	0.69	0.64	0.51	0.56	0.60	0.61	0.58	0.58
4.2	0.70	0.63	0.50	0.54	0.62	0.60	0.55	0.58
4.8	0.70	0.63	0.50	0.54	0.63	0.60	0.55	0.58
5.4	0.71	0.63	0.51	0.57	0.63	0.60	0.55	0.58
6	0.69	0.65	0.53	0.58	0.60	0.63	0.58	0.60
6.6	0.69	0.67	0.54	0.60	0.61	0.63	0.57	0.59
7.2	0.69	0.65	0.55	0.60	0.60	0.62	0.59	0.59
7.8	0.69	0.65	0.55	0.58	0.61	0.62	0.59	0.58
8.4	0.70	0.65	0.55	0.60	0.62	0.62	0.60	0.58

9	0.69	0.65	0.55	0.58	0.61	0.62	0.59	0.58
9.6	0.69	0.65	0.58	0.60	0.61	0.62	0.59	0.59
10.2	0.68	0.65	0.55	0.60	0.59	0.62	0.56	0.59
10.8	0.68	0.64	0.53	0.60	0.59	0.62	0.55	0.59
11.4	0.68	0.64	0.51	0.60	0.59	0.61	0.55	0.59
12	0.68	0.61	0.51	0.60	0.59	0.60	0.53	0.59
12.6	0.68	0.61	0.50	0.58	0.59	0.60	0.52	0.59
13.2	0.66	0.61	0.50	0.60	0.55	0.60	0.51	0.59
13.8	0.65	0.61	0.50	0.56	0.56	0.59	0.50	0.58
14.4	0.64	0.61	0.51	0.54	0.55	0.59	0.50	0.56
15	0.63	0.61	0.53	0.56	0.55	0.59	0.49	0.58
15.6	0.63	0.58	0.54	0.58	0.54	0.58	0.49	0.57
16.2	0.60	0.56	0.53	0.57	0.53	0.57	0.51	0.56
16.8	0.59	0.57	0.53	0.57	0.52	0.56	0.50	0.56
17.4	0.59	0.56	0.54	0.57	0.52	0.55	0.50	0.55
18	0.59	0.57	0.55	0.54	0.50	0.56	0.51	0.53
18.6	0.59	0.57	0.55	0.54	0.51	0.56	0.52	0.53
19.2	0.60	0.57	0.54	0.56	0.51	0.55	0.49	0.54
19.8	0.60	0.57	0.54	0.56	0.51	0.56	0.48	0.54
20.4	0.59	0.58	0.53	0.57	0.51	0.56	0.48	0.56
21	0.55	0.58	0.51	0.57	0.49	0.56	0.47	0.56
21.6	0.55	0.58	0.51	0.58	0.48	0.57	0.46	0.55
22.2	0.53	0.58	0.51	0.58	0.48	0.56	0.46	0.56
22.8	0.51	0.63	0.51	0.58	0.46	0.58	0.45	0.56
23.4	0.50	0.63	0.51	0.58	0.45	0.58	0.45	0.56
24	0.50	0.63	0.51	0.56	0.43	0.58	0.45	0.55
24.6	0.50	0.64	0.51	0.56	0.43	0.58	0.45	0.53
25.2	0.50	0.63	0.51	0.56	0.43	0.58	0.44	0.53
25.8	0.50	0.63	0.49	0.56	0.43	0.58	0.43	0.53
26.4	0.50	0.61	0.48	0.57	0.42	0.57	0.41	0.53
27	0.49	0.61	0.48	0.60	0.41	0.57	0.41	0.55
27.6	0.49	0.61	0.48	0.57	0.41	0.56	0.41	0.54
28.2	0.48	0.61	0.48	0.57	0.41	0.56	0.41	0.53
28.8	0.46	0.61	0.48	0.57	0.39	0.56	0.41	0.53
29.4	0.46	0.58	0.48	0.57	0.39	0.56	0.41	0.53
30	0.46	0.57	0.46	0.56	0.39	0.53	0.39	0.53
30.6	0.46	0.57	0.46	0.56	0.39	0.52	0.39	0.53
31.2	0.45	0.54	0.44	0.56	0.38	0.49	0.38	0.51
31.8	0.45	0.54	0.43	0.56	0.38	0.48	0.38	0.50
32.4	0.45	0.54	0.43	0.54	0.38	0.48	0.36	0.50
33	0.45	0.54	0.43	0.54	0.38	0.49	0.36	0.49
33.6	0.44	0.54	0.43	0.54	0.38	0.49	0.36	0.48
34.2	0.43	0.54	0.43	0.54	0.37	0.49	0.36	0.48
34.8	0.43	0.54	0.43	0.54	0.36	0.50	0.36	0.50
35.4	0.43	0.54	0.43	0.54	0.36	0.50	0.36	0.50



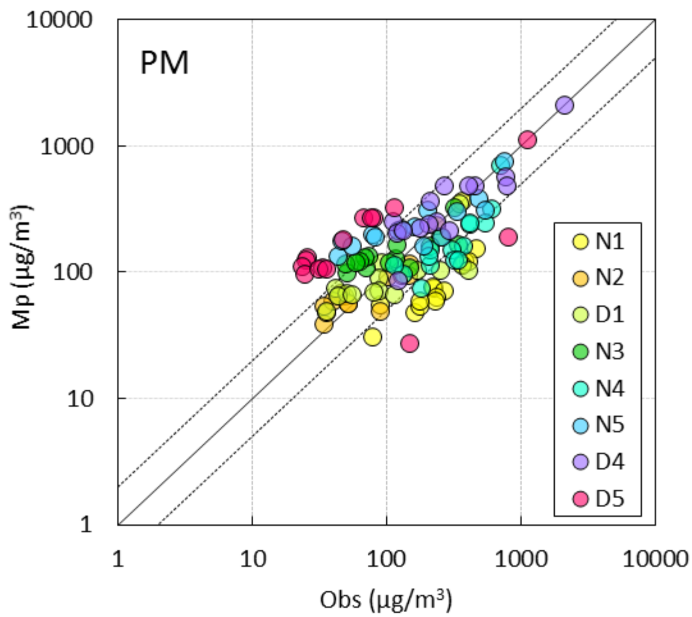
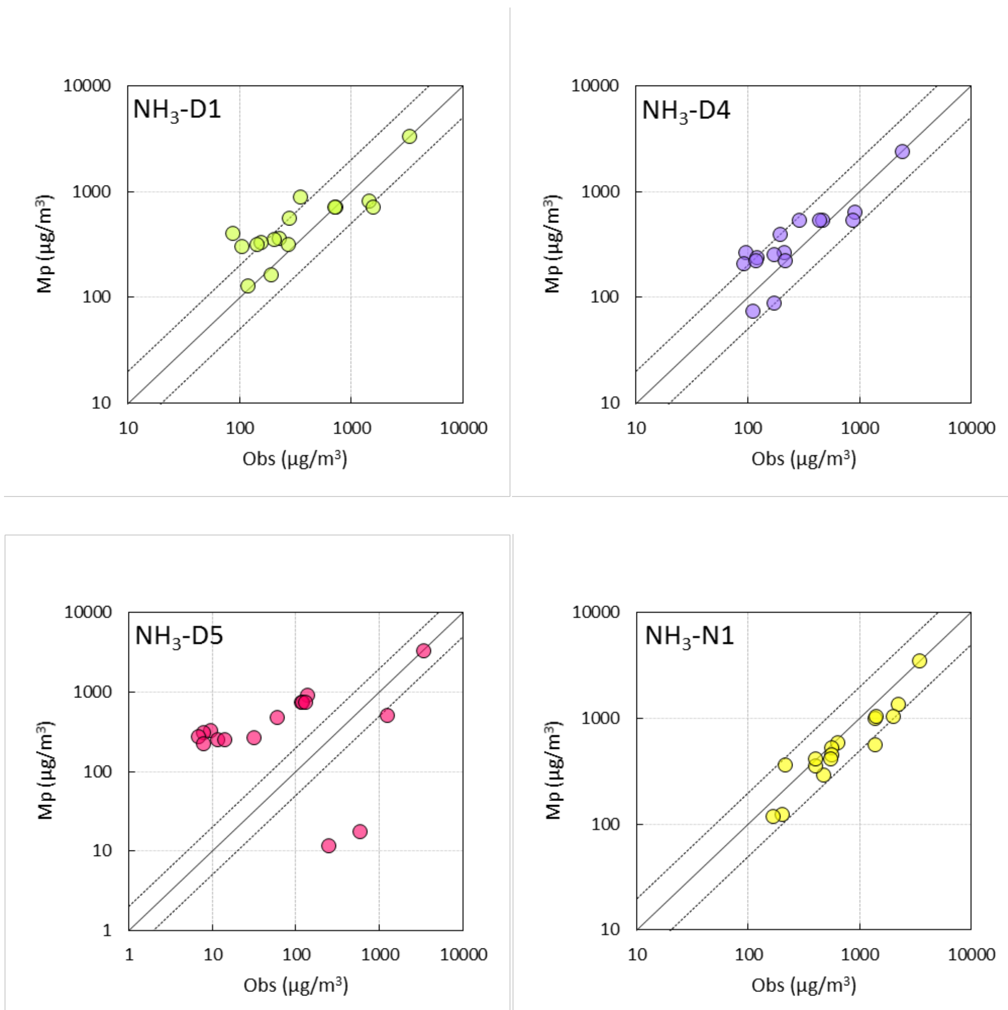


Figure 11. Plot of observed concentration vs. model-predicted concentration of NH_3 and PM. Mp refers to model-predicted concentration; Obs refers to observed concentration. Solid lines are 1:1 ratio, and dash lines are 1:0.5 and 1:2 ratio. N refers to nighttime experiment; D refers to daytime experiment. The points inside the dash lines region means this prediction is good.

Model prediction

Model-predicted concentrations were calculated with an optimal L = 6.6 m (**Appendix E and Appendix F**). Plot of observed concentration and model-predicted concentration of NH_3 and PM were shown in **Figure 11**.

Figure 11 indicated that for both NH_3 and PM, the final model-predicted concentration and observed concentration were positively correlated. However, some outliners existed. D5 data points in **Figure 11** were mostly out of *FAC2* zone, it was more obvious in individual plots (**Figure 12 and Figure 13**). Individual plots indicated that there were no differences between day and night performances, except experiment D5. The possible explanation for undesirable prediction of D5was that the %calm (wind speed < 0.5 m/s) during D5 sampling period was significantly lower than all other experiments (**Figure 7**). Experiments of D2 and D3 were removed from the calculation since their average wind speeds were significantly greater than average wind speeds in other experiments (**Figure 6 and Figure 7**). Therefore, the limitation of this model was that it would have better performance under condition of lower wind speed and higher %calm. PM performance was better than NH_3, and the points were more assembled around 1:1 ratio line. This was probably caused by different weights of NH_3 and PM. NH_3 was small and light molecule, and thus, discharged NH_3 could disperse more easily and gain greater influence from wind for its smaller inertia. Therefore, NH_3 was going to have a greater dispersion rate and fluctuation, making its behavior less predictable than PM. However, dispersion of PM from the chicken house was likely to get more influenced by wind than dispersion of urban PM. The composition of PM from chicken house was mainly organic matters instead of inorganic silicate [12], so PM released from a chicken house had smaller density than urban inorganic PM, making it more diffusible. For 20 m range results, *FAC2* of NH_3 was 0.69 and *FAC2* of PM was 0.67, which were both higher than 40 m range results **(Table 1)**. This indicated that the modified GPM had better performance within shorter range. This results agreed with the hypothesis that the fan wind was dominate in short range. Ambient wind applied stronger influence on the plume when the distance increases



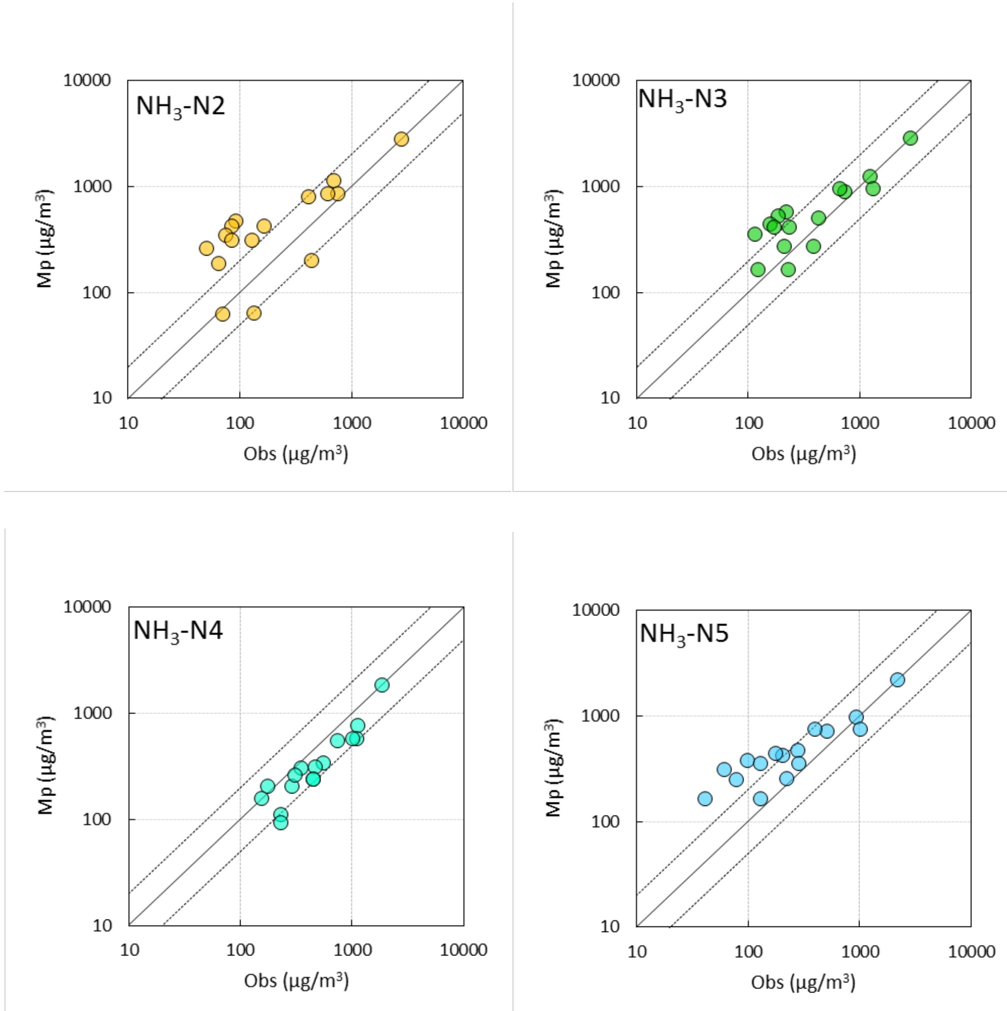
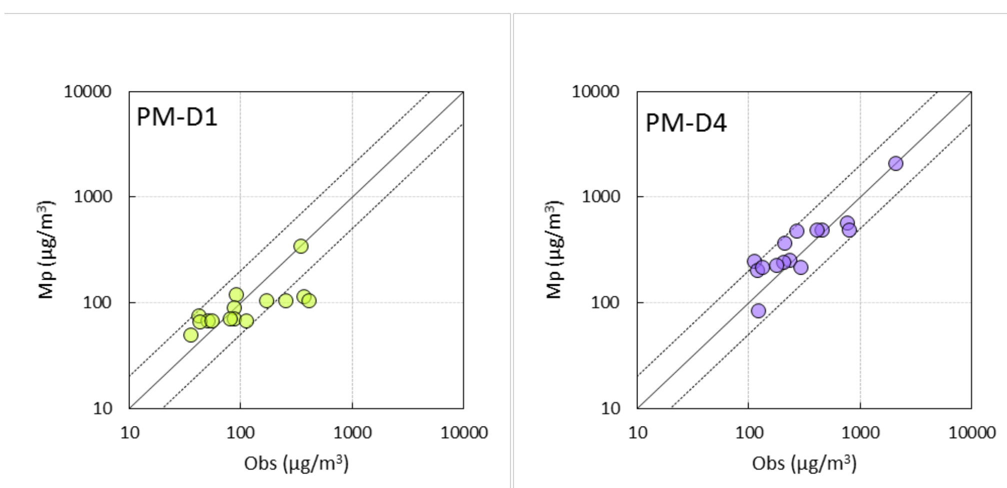


Figure 12. Individual plot of Obs vs Mp of NH_3. Mp refers to model-predicted concentration; Obs refers to observed concentration. Solid lines are 1:1 ratio, and dash lines are 1:0.5 and 1:2 ratio. N refers to nighttime experiment; D refers to daytime experiment.



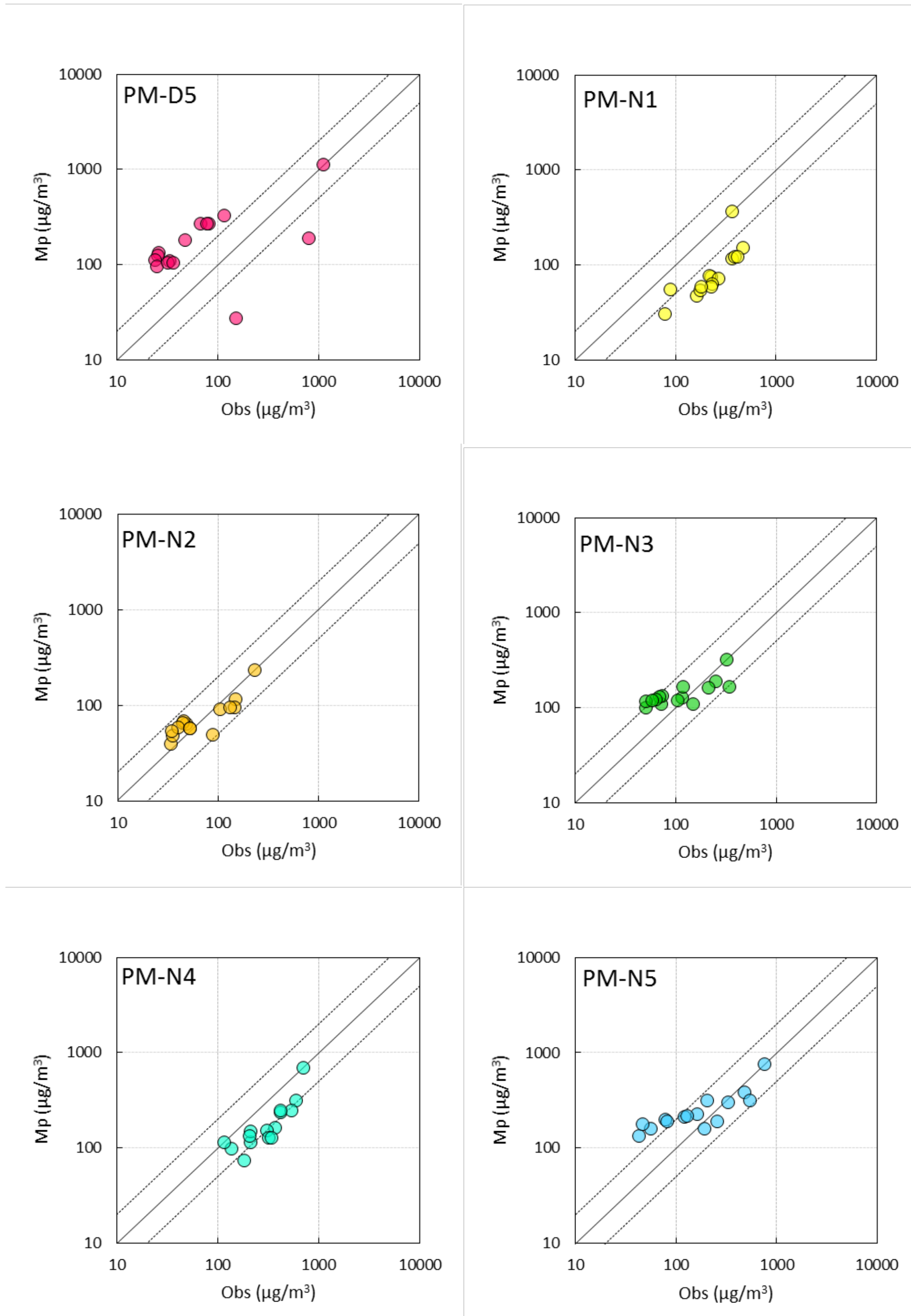


Figure 13. Individual plot of Obs vs Mp of PM. Mp refers to model-predicted concentration; Obs refers to observed concentration. Solid lines are 1:1 ratio, and dash lines are 1:0.5 and 1:2 ratio. N refers to nighttime experiment; D refers to daytime experiment.

To evaluate model performance of each sampling point, influence of magnitude should be eliminated since the concentration values are ranging from about 20 μg/L to 1000 μg/L , distance of a point from 1:1 ratio line in log10 scale was used to evaluate if the model was over-predicted or under-predicted, and this distance was noted as *d*. If the model was over-predicted, *d* was positive, and if the model was under-predicted, *d* was negative. The geometry of *d* was shown in **Figure 14**. *d* was served as an indicator of variation, and it could be expressed as:

$$d = \frac{\log_{10} C_{Sn}^{\mathrm{Mp}} - \log_{10} C_{Sn}^{\mathrm{Obs}}}{\sqrt{2}} \qquad (\mathrm{Eq.}\,12)$$

where C_{Sn}^{Mp} was model-predicted concentration at the sampler of interest; C_{Sn}^{Obs} was the observed concentration at the same sampler of interest. The factor *F* defined as the ratio of model-prediction over observation:

$$F = \frac{C_{Sn}^{\mathrm{Mp}}}{C_{Sn}^{\mathrm{Obs}}} \qquad (\mathrm{Eq.}\,13)$$

According to (Eq. 12) and (Eq. 13), we had following relation:

$$F = 10^{\sqrt{2}\cdot d} \qquad (\mathrm{Eq.}\,14)$$

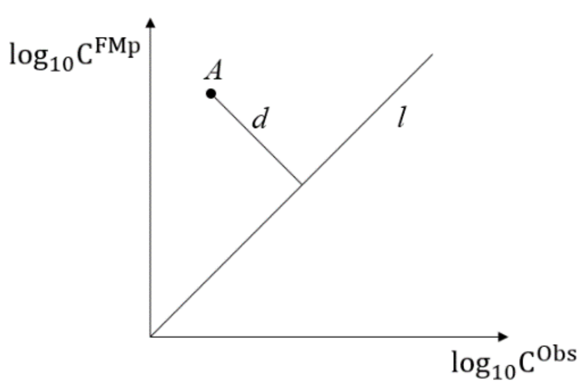


Figure 14. Illustration of *d*. *l* was 1:1 ratio line; C^{FMp} was model-predicted concentration; C^{Obs} was observed concentration.

The results of *d* were shown in **Figure 15**. **Figure 15** showed that both NH_3 (median: d = 0.09, F = 1.35; median: d = 0.12, F = 1.47) and PM (median: d = 0.01, F = 1.02; mean: d = -0.01, F = 0.98) had good performance while PM had smaller variations. Concentrations of T1 samplers were likely to be under-predicted. For T2 lower samplers (2 m height) the model was likely to slightly under-predict, and however, for higher samplers (4.5 m, 7.25 m, and 10 m height), the factor was increasing. Interestingly, at T2-2, PM was under-predicted but NH_3 was over-predicted, this could be explained by the difference of dispersion behaviors between these two pollutants. Heavier PM particles has less trend to deposit while NH_3 was likely to rise up. Therefore, the deposition of PM made the real concentration in lower samplers greater than prediction while NH_3 concentration decreased more rapidly along the distance for more rapid disperse rate.

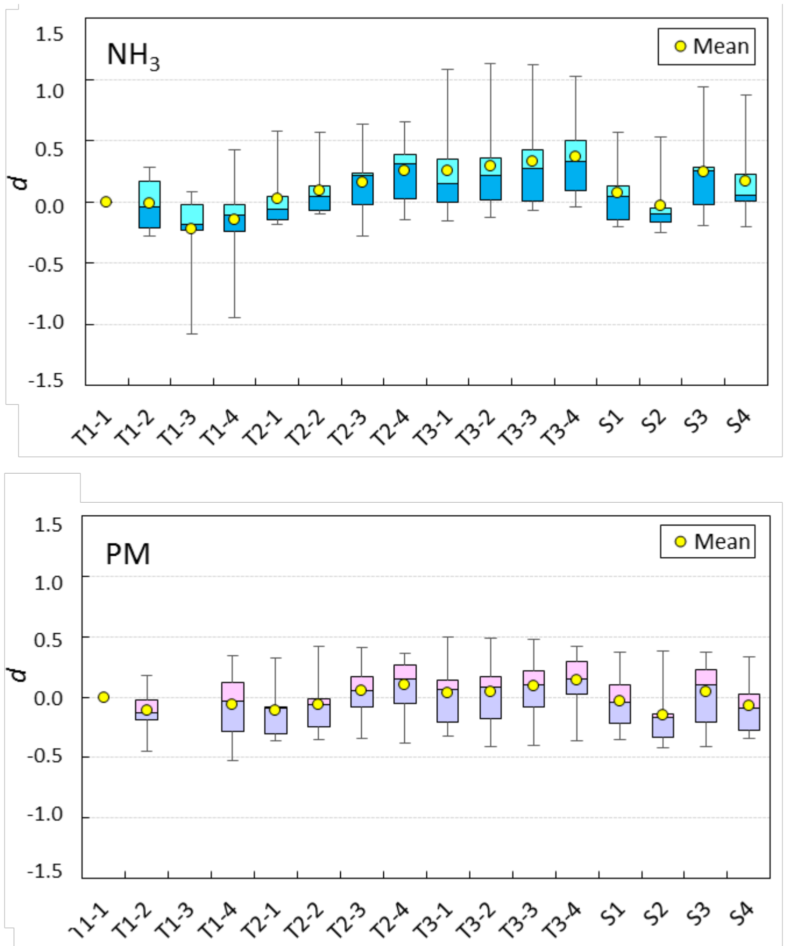


Figure 15. Box plot of *d* of each sampler of NH_3 and PM.

A possible reason for over-prediction was that reflection was assumed to be one, but in reality, some of the pollutants would deposit or be absorbed by vegetation on the ground, which decreased reflected concentration. In addition, ground between virtual point and fan has reflection effect in calculation, which was the distance of 6.6 m between the fan and virtual point. However, in reality, this part had no reflection. Another possible explanation was that background concentration might be large, which was greater than some concentration of the on-site sampling point in the domain (**Appendix G)**. For example, in N5 experiment, background concentration was 164 μg/L, but for sampler T2-4, the concentration was only 78 μg/L. For a sampler that was far from the fan, $C_{Sn}^{\mathrm{PMp}|Q=1}$ was much smaller than $C_{\mathrm{T1-1}}^{PMp|Q=1}$, and therefore:

$$C_{Sn}^{PMp|Q=1} \ll C_{\mathrm{T1-1}}^{PMp|Q=1} \Rightarrow \begin{cases} \dfrac{C_{Sn}^{\mathrm{PMp}|Q=1}}{C_{\mathrm{T1-1}}^{\mathrm{PMp}|Q=1}} \approx 0 \\ 1 - \dfrac{C_{Sn}^{\mathrm{PMp}|Q=1}}{C_{\mathrm{T1-1}}^{\mathrm{PMp}|Q=1}} \approx 1 \end{cases} \qquad (\mathrm{Eq.}\,15)$$

Combine (Eq.10.5) and (Eq.15), it indicated that the term $\left[1 - \left(\frac{C_{Sn}^{\mathrm{PMp}|Q=1}}{C_{\mathrm{T1-1}}^{\mathrm{PMp}|Q=1}}\right)\right] C_{\mathrm{bg}}$ in (Eq. 10.5) might become comparative or even greater than term $\left(C_{Sn}^{\mathrm{PMp}|Q=1}/C_{\mathrm{T1-1}}^{\mathrm{PMp}|Q=1}\right) \cdot C_{\mathrm{T1-1}}^{\mathrm{Obs}}$ in (Eq. 10.5) when $C_{Sn}^{\mathrm{PMp}|Q=1} \ll C_{\mathrm{T1-1}}^{\mathrm{PMp}|Q=1}$. Thus, sampler that was spatially far away from the fan would be strongly influenced by background concentration. When the values of $C_{Sn}^{\mathrm{PMp}|Q=1}$ and $C_{\mathrm{T1-1}}^{\mathrm{PMp}|Q=1}$ got closer, this effect declined.

Sensitivity

In order to provide more insight into the model, sensitivity of the model as it relates to different condition scenarios was evaluated. Condition scenario referred to some specific conditions of interest, and the results were evaluated by *FAC2*. Condition scenario consisted of four components, including background scenario (BGS), experiment scenario (EXS), sampler scenario (SPS) and wind speed scenario (WSS). BGS referred to the conditions that C_{bg} term in (Eq. 10.5) was (1) equal to observed background concentration ("bg method"); (2) C_{bg} was equal to minimum on-site observed concentration ("MIN method"); (3) C_{bg} was equal to zero ("bg=0 method"). EXS referred to the conditions including (1) all 10 experiments were used; (2) experiment D2 and D3 were removed; (3) D2, D3 and D5 were removed. SPS referred to the conditions including (1) all samplers were used; (2) T1-3 and T1-4 were removed; (3) T1-2, T1-3 and T1-4 were removed. WSS referred to the conditions that meteorological input was based on different sampler combinations (**Figure 1**). Details of condition scenario were shown in **Appendix J** and **Appendix K**, and results were shown in **Appendix K.**

The results were organized in several groups to compare. **Figure 16** demonstrated the sensitivity of average *FAC2* of PM and NH_3 to BGS. It indicated that "MIN method" has better performance than "bg method" and "bg=0 method". This might be due to some of the on-site samplers were "out pf the plume", like T1-3 and T1-4, and the observed concentration of these samplers had approximate values to the background. Although "MIN method" had better performance, using observed background was a more general approach. **Figure 17** demonstrated the sensitivity of optimal *L* to BGS. It indicated that optimal *L* was not sensitive between "bg method" and "MIN method", but optimal *L* of "bg=0 method" was different from "bg method" and "MIN method". Therefore, optimal *L* equaled to 6.6 m was also reasonable under condition of "MIN method", but it did not work under condition of "bg=0 method".

Figure 18 demonstrated the sensitivity of average *FAC2* of PM and NH_3 to EXS. It indicated that model did not perform well for experiment D2, D3 and D5. According to **Figure 8**, D2 and D3 had larger average background wind speed and very small %calm. D5 also had very small value of %calm. Therefore, one of the limitations of this model was that it was hard to deal with conditions when background wind speed was too large (>3m/s), and therefore this model perform better when dealing with stable atmospheric conditions. **Figure 19** demonstrated the sensitivity of optimal *L* to EXS. Removal of D2, D3 and D5 would not change the value of optimal *L*. By using "MIN method", optimal *L* had small change between 6.6 m and 8.4 m, and therefore optimal *L* was not sensitive to EXS.

Figure 20 demonstrated the sensitivity of *FAC2* to SPS. It indicated that there was little difference among condition with all samplers, condition without T1-3 and T1-4, and condition without T1-2, T1-3 and T1-4. Therefore, *FAC2* was not sensitive to whether using T1-2, T1-3, T1-4 samplers or not. **Figure 21** demonstrated the sensitivity of optimal *L* to the change of SPS. It indicated that removal of T1-3, T1-4 did not have an obvious influence on optimal *L*. However, if T1-2 was also removed, optimal *L* had an obvious decrease from 6.6 m to about 1.2 m. The possible explanation was that T1 was 2 m away from the fan while T2 was 23 m away from the fan. If T1 samplers were removed, fan size (1.2 m in diameter) was much smaller than distance between samplers and fan (23 m for T2 and 47 m for T3), and therefore assuming fan as a point source generated less error. Therefore, assumptions of virtual point and optimal *L* were more suitable for situations when samplers were very close to the fan. This results also demonstrated that this model was able to deal with samplers that were "out of the plume", like T1-3 and T1-4 in this case. In reality, the plume had very little contribution to T1-3 and T1-4, which might be ignored. According to (Eq. 10.5), background concentration was used to correct this error:

$$C_{Sn}^{Mp|Q=R} = \frac{C_{Sn}^{PMp|Q=1}}{C_{\mathrm{T1-1}}^{PMp|Q=1}} \cdot C_{\mathrm{T1-1}}^{Obs} + \frac{C_{\mathrm{T1-1}}^{PMp|Q=1} - C_{Sn}^{PMp|Q=1}}{C_{\mathrm{T1-1}}^{PMp|Q=1}} \cdot C_{bg} \quad (\mathrm{Eq.\ 10.5})$$

For samplers that were “out of the plume”, like T1-3 and T1-4, $\frac{C_{Sn}^{PMp|Q=1}}{C_{\mathrm{T1-1}}^{PMp|Q=1}}$ term was going to be very small while $\frac{C_{\mathrm{T1-1}}^{PMp|Q=1} - C_{Sn}^{PMp|Q=1}}{C_{\mathrm{T1-1}}^{PMp|Q=1}}$ term was going to approach to one:

$$C_{T1-3,T1-4}^{PMp|Q=1} \approx 0 \Rightarrow \begin{cases} \dfrac{C_{T1-3,T1-4}^{PMp|Q=1}}{C_{\mathrm{T1-1}}^{PMp|Q=1}} \approx 0 \\ \dfrac{C_{\mathrm{T1-1}}^{PMp|Q=1} - C_{T1-3,T1-4}^{PMp|Q=1}}{C_{\mathrm{T1-1}}^{PMp|Q=1}} \approx 1 \end{cases} \qquad \text{(Eq. 16.1)}$$

$$\Rightarrow C_{T1-3,T1-4}^{Mp|Q=R} \approx C_{bg} \qquad \text{(Eq. 16.2)}$$

Therefore, this model was able to deal with samplers that were “out of the plume”.

Figure 22 demonstrated the sensitivity of *FAC2* to change of WSS. It indicated that performance of the model was not sensitive to WSS or *L* ranging around 6.6 m. **Figure 23** demonstrated the sensitivity of optimal *L* to change of WSS. It indicated that optimal *L* was not sensitive to wind speed sampler combinations.

L[m]	0.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0
A1-1	0.44	0.51	0.52	0.51	0.51	0.51	0.52	0.52	0.53	0.53	0.53	0.54	0.53	0.53	0.53	0.53	0.52	0.51	0.51	0.51	0.50
A1-2	0.51	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59
A1-3	0.50	0.59	0.61	0.60	0.60	0.60	0.61	0.62	0.62	0.62	0.62	0.62	0.61	0.62	0.62	0.61	0.61	0.60	0.60	0.60	0.59
A1-5	0.57	0.66	0.68	0.67	0.67	0.67	0.68	0.69	0.69	0.69	0.69	0.70	0.69	0.69	0.69	0.69	0.69	0.68	0.67	0.67	0.66
A1-6	0.43	0.50	0.52	0.51	0.51	0.51	0.52	0.52	0.53	0.53	0.53	0.53	0.52	0.53	0.53	0.52	0.51	0.51	0.51	0.50	0.50
A2-1	0.43	0.50	0.53	0.52	0.51	0.52	0.52	0.52	0.52	0.53	0.53	0.54	0.53	0.53	0.53	0.52	0.51	0.50	0.50	0.50	0.50
A2-2	0.50	0.59	0.61	0.60	0.60	0.60	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.59
A2-3	0.49	0.59	0.62	0.61	0.60	0.61	0.61	0.62	0.62	0.62	0.62	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.58
A2-5	0.56	0.66	0.69	0.68	0.67	0.68	0.68	0.69	0.69	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.67	0.66	0.66	0.66	0.65
A2-6	0.42	0.50	0.53	0.52	0.51	0.52	0.52	0.52	0.52	0.53	0.53	0.53	0.52	0.52	0.52	0.52	0.51	0.50	0.50	0.50	0.49
X1-1	0.47	0.58	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.58
X1-2	0.55	0.68	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.68	0.69	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.68	0.68
X1-3	0.52	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.68	0.68	0.67	0.68	0.67	0.68	0.69	0.67	0.67	0.67	0.67	0.67	0.66
X1-5	0.62	0.77	0.78	0.78	0.77	0.78	0.78	0.78	0.78	0.78	0.77	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.76	0.76	0.75
X1-6	0.44	0.57	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.59	0.59	0.59	0.59	0.58	0.58	0.57	0.57	0.57	0.56
X2-1	0.46	0.57	0.59	0.59	0.59	0.59	0.60	0.59	0.59	0.60	0.60	0.60	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.59	0.59
X2-2	0.54	0.67	0.69	0.69	0.69	0.69	0.70	0.69	0.68	0.69	0.68	0.69	0.68	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68
X2-3	0.51	0.66	0.68	0.68	0.68	0.68	0.69	0.68	0.67	0.68	0.67	0.68	0.67	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.66
X2-5	0.60	0.75	0.78	0.78	0.78	0.78	0.79	0.78	0.77	0.78	0.77	0.78	0.77	0.78	0.78	0.77	0.77	0.77	0.76	0.76	0.76
X2-6	0.43	0.56	0.58	0.58	0.58	0.58	0.59	0.58	0.57	0.58	0.58	0.59	0.58	0.59	0.59	0.58	0.58	0.57	0.57	0.57	0.56
Y1-1	0.38	0.43	0.41	0.41	0.41	0.40	0.42	0.41	0.42	0.43	0.43	0.44	0.44	0.44	0.44	0.45	0.46	0.47	0.48	0.46	0.46
Y1-2	0.44	0.47	0.44	0.44	0.44	0.44	0.45	0.46	0.47	0.47	0.48	0.48	0.48	0.48	0.49	0.49	0.50	0.52	0.53	0.51	0.52
Y1-3	0.49	0.53	0.50	0.49	0.49	0.49	0.50	0.51	0.52	0.53	0.53	0.53	0.53	0.54	0.54	0.54	0.55	0.57	0.58	0.57	0.57
Y1-5	0.49	0.52	0.49	0.48	0.48	0.48	0.50	0.51	0.53	0.53	0.54	0.54	0.54	0.54	0.54	0.54	0.56	0.58	0.59	0.57	0.58
Y1-6	0.42	0.48	0.46	0.45	0.45	0.45	0.46	0.46	0.47	0.48	0.48	0.49	0.49	0.49	0.49	0.49	0.50	0.51	0.52	0.51	0.50
Y2-1	0.37	0.44	0.43	0.41	0.40	0.41	0.42	0.42	0.42	0.43	0.44	0.43	0.44	0.44	0.45	0.45	0.46	0.47	0.48	0.46	0.46
Y2-2	0.43	0.48	0.46	0.44	0.44	0.44	0.45	0.46	0.46	0.47	0.48	0.47	0.48	0.48	0.49	0.49	0.50	0.51	0.53	0.51	0.52
Y2-3	0.47	0.53	0.52	0.49	0.49	0.49	0.50	0.51	0.52	0.53	0.54	0.53	0.53	0.54	0.54	0.54	0.55	0.56	0.58	0.57	0.57
Y2-5	0.47	0.53	0.51	0.48	0.48	0.49	0.50	0.52	0.52	0.53	0.54	0.53	0.54	0.54	0.55	0.55	0.56	0.57	0.59	0.57	0.57
Y2-6	0.41	0.48	0.48	0.46	0.45	0.45	0.46	0.46	0.46	0.48	0.49	0.48	0.49	0.49	0.49	0.49	0.50	0.50	0.52	0.50	0.50

Figure 16. Trend of *FAC2* to BGS. *L* refers to the distance between virtual point and fan. Color scale was applied to the whole *FAC2* data set: red refers to greater value, green refers to smaller values, and the values inside each cell are *FAC2*.

L[m]	0.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0
A1-1	0.44	0.51	0.52	0.51	0.51	0.51	0.52	0.52	0.53	0.53	0.53	0.54	0.53	0.53	0.53	0.53	0.52	0.51	0.51	0.51	0.50
A1-2	0.51	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59
A1-3	0.50	0.59	0.61	0.60	0.60	0.60	0.61	0.62	0.62	0.62	0.62	0.62	0.61	0.62	0.62	0.61	0.61	0.60	0.60	0.60	0.59
A1-5	0.57	0.66	0.68	0.67	0.67	0.67	0.68	0.69	0.69	0.69	0.69	0.70	0.69	0.69	0.69	0.69	0.69	0.68	0.67	0.67	0.66
A1-6	0.43	0.50	0.52	0.51	0.51	0.51	0.52	0.52	0.53	0.53	0.53	0.53	0.52	0.53	0.53	0.52	0.51	0.51	0.51	0.50	0.50
A2-1	0.43	0.50	0.53	0.52	0.51	0.52	0.52	0.52	0.52	0.53	0.53	0.54	0.53	0.53	0.53	0.52	0.51	0.50	0.50	0.50	0.50
A2-2	0.50	0.59	0.61	0.60	0.60	0.60	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.59
A2-3	0.49	0.59	0.62	0.61	0.60	0.61	0.61	0.62	0.62	0.62	0.62	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.58
A2-5	0.56	0.66	0.69	0.68	0.67	0.68	0.68	0.69	0.69	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.67	0.66	0.66	0.66	0.65
A2-6	0.42	0.50	0.53	0.52	0.51	0.52	0.52	0.52	0.52	0.53	0.53	0.53	0.52	0.52	0.52	0.52	0.51	0.50	0.50	0.50	0.49
X1-1	0.47	0.58	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.58
X1-2	0.55	0.68	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.68	0.69	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.68	0.68
X1-3	0.52	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.68	0.68	0.67	0.68	0.67	0.68	0.69	0.67	0.67	0.67	0.67	0.67	0.66
X1-5	0.62	0.77	0.78	0.78	0.77	0.78	0.78	0.78	0.78	0.78	0.77	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.76	0.76	0.75
X1-6	0.44	0.57	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.59	0.59	0.59	0.59	0.58	0.58	0.57	0.57	0.57	0.56
X2-1	0.46	0.57	0.59	0.59	0.59	0.59	0.60	0.59	0.59	0.60	0.60	0.60	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.59	0.59
X2-2	0.54	0.67	0.69	0.69	0.69	0.69	0.70	0.69	0.68	0.69	0.68	0.69	0.68	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68
X2-3	0.51	0.66	0.68	0.68	0.68	0.68	0.69	0.68	0.67	0.68	0.67	0.68	0.67	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.66
X2-5	0.60	0.75	0.78	0.78	0.78	0.78	0.79	0.78	0.77	0.78	0.77	0.78	0.77	0.78	0.78	0.77	0.77	0.77	0.76	0.76	0.76
X2-6	0.43	0.56	0.58	0.58	0.58	0.58	0.59	0.58	0.57	0.58	0.58	0.59	0.58	0.59	0.59	0.58	0.58	0.57	0.57	0.57	0.56
Y1-1	0.38	0.43	0.41	0.41	0.41	0.40	0.42	0.41	0.42	0.43	0.43	0.44	0.44	0.44	0.44	0.45	0.46	0.47	0.48	0.46	0.46
Y1-2	0.44	0.47	0.44	0.44	0.44	0.44	0.45	0.46	0.47	0.47	0.48	0.48	0.48	0.48	0.49	0.49	0.50	0.52	0.53	0.51	0.52
Y1-3	0.49	0.53	0.50	0.49	0.49	0.49	0.50	0.51	0.52	0.53	0.53	0.53	0.53	0.54	0.54	0.54	0.55	0.57	0.58	0.57	0.57
Y1-5	0.49	0.52	0.49	0.48	0.48	0.48	0.50	0.51	0.53	0.53	0.54	0.54	0.54	0.54	0.54	0.54	0.56	0.58	0.59	0.57	0.58
Y1-6	0.42	0.48	0.46	0.45	0.45	0.45	0.46	0.46	0.47	0.48	0.48	0.49	0.49	0.49	0.49	0.49	0.50	0.51	0.52	0.51	0.50
Y2-1	0.37	0.44	0.43	0.41	0.40	0.41	0.42	0.42	0.42	0.43	0.44	0.43	0.44	0.44	0.45	0.45	0.46	0.47	0.48	0.46	0.46
Y2-2	0.43	0.48	0.46	0.44	0.44	0.44	0.45	0.46	0.46	0.47	0.48	0.47	0.48	0.48	0.49	0.49	0.50	0.51	0.53	0.51	0.52
Y2-3	0.47	0.53	0.52	0.49	0.49	0.49	0.50	0.51	0.52	0.53	0.54	0.53	0.53	0.54	0.54	0.54	0.55	0.56	0.58	0.57	0.57
Y2-5	0.47	0.53	0.51	0.48	0.48	0.49	0.50	0.52	0.52	0.53	0.54	0.53	0.54	0.54	0.55	0.55	0.56	0.57	0.59	0.57	0.57
Y2-6	0.41	0.48	0.48	0.46	0.45	0.45	0.46	0.46	0.46	0.48	0.49	0.48	0.49	0.49	0.49	0.49	0.50	0.50	0.52	0.50	0.50

Figure 17. Trend of optimal L to BGS. L refers to the distance between virtual point and fan. Color scale was applied to each row separately: red refers to greater value, green refers to smaller values, and the values inside each cell are *FAC2*.

L[m]	0.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0
A1-1	0.44	0.51	0.52	0.51	0.51	0.51	0.52	0.52	0.53	0.53	0.53	0.54	0.53	0.53	0.53	0.53	0.52	0.51	0.51	0.51	0.50
A1-2	0.51	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59
A1-5	0.57	0.66	0.68	0.67	0.67	0.67	0.68	0.69	0.69	0.69	0.69	0.70	0.69	0.69	0.69	0.69	0.69	0.68	0.67	0.67	0.66
A2-1	0.43	0.50	0.53	0.52	0.51	0.52	0.52	0.52	0.52	0.53	0.53	0.54	0.53	0.53	0.53	0.52	0.51	0.50	0.50	0.50	0.50
A2-2	0.50	0.59	0.61	0.60	0.60	0.60	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.59
A2-5	0.56	0.66	0.69	0.68	0.67	0.68	0.68	0.69	0.69	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.67	0.66	0.66	0.66	0.65
A4-1	0.45	0.51	0.52	0.52	0.51	0.51	0.52	0.52	0.53	0.53	0.54	0.54	0.53	0.53	0.53	0.53	0.52	0.51	0.51	0.51	0.50
A4-2	0.53	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.62	0.62	0.62	0.61	0.61	0.62	0.62	0.61	0.60	0.60	0.60	0.59
A4-5	0.59	0.67	0.68	0.68	0.67	0.67	0.68	0.69	0.69	0.70	0.70	0.70	0.69	0.69	0.69	0.69	0.68	0.67	0.67	0.67	0.65
X1-1	0.47	0.58	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.58
X1-2	0.55	0.68	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.68	0.69	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.68	0.68
X1-5	0.62	0.77	0.78	0.78	0.77	0.78	0.78	0.78	0.78	0.78	0.77	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.76	0.76	0.75
X2-1	0.46	0.57	0.59	0.59	0.59	0.59	0.60	0.59	0.59	0.60	0.60	0.60	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.59	0.59
X2-2	0.54	0.67	0.69	0.69	0.69	0.69	0.70	0.69	0.68	0.69	0.68	0.69	0.68	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68
X2-5	0.60	0.75	0.78	0.78	0.78	0.78	0.79	0.78	0.77	0.78	0.77	0.78	0.77	0.78	0.78	0.77	0.77	0.77	0.76	0.76	0.76

Figure 18. Trend of *FAC2* to EXS. *L* refers to the distance between virtual point and fan. Color scale was applied to the whole *FAC2* data set: red refers to greater value, green refers to smaller values, and the values inside each cell are *FAC2*.

L[m]	0.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0
A1-1	0.44	0.51	0.52	0.51	0.51	0.51	0.52	0.52	0.53	0.53	0.53	0.54	0.53	0.53	0.53	0.53	0.52	0.51	0.51	0.51	0.50
A1-2	0.51	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59
A1-5	0.57	0.66	0.68	0.67	0.67	0.67	0.68	0.69	0.69	0.69	0.69	0.70	0.69	0.69	0.69	0.69	0.69	0.68	0.67	0.67	0.66
A2-1	0.43	0.50	0.53	0.52	0.51	0.52	0.52	0.52	0.52	0.53	0.53	0.54	0.53	0.53	0.53	0.52	0.51	0.50	0.50	0.50	0.50
A2-2	0.50	0.59	0.61	0.60	0.60	0.60	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.59
A2-5	0.56	0.66	0.69	0.68	0.67	0.68	0.68	0.69	0.69	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.67	0.66	0.66	0.66	0.65
A4-1	0.45	0.51	0.52	0.52	0.51	0.51	0.52	0.52	0.53	0.53	0.54	0.54	0.53	0.53	0.53	0.53	0.52	0.51	0.51	0.51	0.50
A4-2	0.53	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.62	0.62	0.62	0.61	0.61	0.62	0.62	0.61	0.60	0.60	0.60	0.59
A4-5	0.59	0.67	0.68	0.68	0.67	0.67	0.68	0.69	0.69	0.70	0.70	0.70	0.69	0.69	0.69	0.69	0.68	0.67	0.67	0.67	0.65
X1-1	0.47	0.58	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.58
X1-2	0.55	0.68	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.68	0.69	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.68	0.68
X1-5	0.62	0.77	0.78	0.78	0.77	0.78	0.78	0.78	0.78	0.78	0.77	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.76	0.76	0.75
X2-1	0.46	0.57	0.59	0.59	0.59	0.59	0.60	0.59	0.59	0.60	0.60	0.60	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.59	0.59
X2-2	0.54	0.67	0.69	0.69	0.69	0.69	0.70	0.69	0.68	0.69	0.68	0.69	0.68	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68
X2-5	0.60	0.75	0.78	0.78	0.78	0.78	0.79	0.78	0.77	0.78	0.77	0.78	0.77	0.78	0.78	0.77	0.77	0.77	0.76	0.76	0.76

Figure 19. Trend of optimal *L* to EXS. *L* refers to the distance between virtual point and fan. Color scale was applied to each row separately: red refers to greater value, green refers to smaller values, and the values inside each cell are *FAC2*.

L[m]	0.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0
A1-2	0.51	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59
A1-3	0.50	0.59	0.61	0.60	0.60	0.60	0.61	0.62	0.62	0.62	0.62	0.62	0.61	0.62	0.62	0.61	0.61	0.60	0.60	0.60	0.59
A1-4	0.51	0.62	0.63	0.63	0.62	0.62	0.62	0.62	0.63	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59
A2-2	0.50	0.59	0.61	0.60	0.60	0.60	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.59
A2-3	0.49	0.59	0.62	0.61	0.60	0.61	0.61	0.62	0.62	0.62	0.62	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.58
A2-4	0.50	0.61	0.64	0.63	0.63	0.63	0.62	0.63	0.63	0.62	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.59	0.59	0.59	0.59
A4-2	0.53	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.62	0.62	0.62	0.61	0.61	0.62	0.62	0.61	0.60	0.60	0.60	0.59
A4-3	0.52	0.60	0.61	0.61	0.60	0.60	0.61	0.62	0.62	0.63	0.63	0.62	0.62	0.62	0.62	0.62	0.61	0.60	0.60	0.60	0.58
A4-4	0.54	0.62	0.63	0.63	0.62	0.62	0.62	0.62	0.63	0.63	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59
X1-2	0.55	0.68	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.68	0.69	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.68	0.68
X1-3	0.52	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.68	0.68	0.67	0.68	0.67	0.68	0.69	0.67	0.67	0.67	0.67	0.67	0.66
X1-4	0.54	0.70	0.72	0.72	0.71	0.71	0.70	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.67	0.67	0.67	0.67	0.67	0.67
X2-2	0.54	0.67	0.69	0.69	0.69	0.69	0.70	0.69	0.68	0.69	0.68	0.69	0.68	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68
X2-3	0.51	0.66	0.68	0.68	0.68	0.68	0.69	0.68	0.67	0.68	0.67	0.68	0.67	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.66
X2-4	0.53	0.69	0.71	0.72	0.72	0.71	0.71	0.70	0.69	0.69	0.69	0.69	0.69	0.69	0.68	0.67	0.67	0.67	0.67	0.67	0.67

Figure 20. Trend of *FAC2* to SPS. *L* refers to the distance between virtual point and fan. Color scale was applied to the whole *FAC2* data set: red refers to greater value, green refers to smaller values, and the values inside each cell are *FAC2*.

L[m]	0.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0
A1-2	0.51	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59
A1-3	0.50	0.59	0.61	0.60	0.60	0.60	0.61	0.62	0.62	0.62	0.62	0.62	0.61	0.62	0.62	0.61	0.61	0.60	0.60	0.60	0.59
A1-4	0.51	0.62	0.63	0.63	0.62	0.62	0.62	0.62	0.63	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59
A2-2	0.50	0.59	0.61	0.60	0.60	0.60	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.59
A2-3	0.49	0.59	0.62	0.61	0.60	0.61	0.61	0.62	0.62	0.62	0.62	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.58
A2-4	0.50	0.61	0.64	0.63	0.63	0.63	0.62	0.63	0.63	0.62	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.59	0.59	0.59	0.59
A4-2	0.53	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.62	0.62	0.62	0.61	0.61	0.62	0.62	0.61	0.60	0.60	0.60	0.59
A4-3	0.52	0.60	0.61	0.61	0.60	0.60	0.61	0.62	0.62	0.63	0.63	0.62	0.62	0.62	0.62	0.62	0.61	0.60	0.60	0.60	0.58
A4-4	0.54	0.62	0.63	0.63	0.62	0.62	0.62	0.62	0.63	0.63	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59
X1-2	0.55	0.68	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.68	0.69	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.68	0.68
X1-3	0.52	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.68	0.68	0.67	0.68	0.67	0.68	0.69	0.67	0.67	0.67	0.67	0.67	0.66
X1-4	0.54	0.70	0.72	0.72	0.71	0.71	0.70	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.67	0.67	0.67	0.67	0.67	0.67
X2-2	0.54	0.67	0.69	0.69	0.69	0.69	0.70	0.69	0.68	0.69	0.68	0.69	0.68	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68
X2-3	0.51	0.66	0.68	0.68	0.68	0.68	0.69	0.68	0.67	0.68	0.67	0.68	0.67	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.66
X2-4	0.53	0.69	0.71	0.72	0.72	0.71	0.71	0.70	0.69	0.69	0.69	0.69	0.69	0.69	0.68	0.67	0.67	0.67	0.67	0.67	0.67

Figure 21. Trend of optimal *L* to SPS. *L* refers to the distance between virtual point and fan. Color scale was applied to each row separately: red refers to greater value, green refers to smaller values, and the values inside each cell are *FAC2*.

L[m]	0.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0
A1-2	0.51	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59
A2-2	0.50	0.59	0.61	0.60	0.60	0.60	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.59
B1-2	0.55	0.61	0.60	0.60	0.59	0.60	0.60	0.60	0.61	0.61	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59
B2-2	0.55	0.61	0.60	0.60	0.59	0.60	0.60	0.60	0.61	0.61	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59
C1-2	0.58	0.60	0.59	0.58	0.60	0.60	0.60	0.60	0.60	0.61	0.62	0.61	0.61	0.60	0.60	0.60	0.60	0.59	0.60	0.58	0.57
C2-2	0.57	0.61	0.59	0.59	0.60	0.60	0.60	0.59	0.60	0.60	0.61	0.60	0.61	0.60	0.60	0.60	0.60	0.59	0.59	0.58	0.57
D1-2	0.59	0.58	0.58	0.58	0.59	0.60	0.59	0.59	0.60	0.61	0.60	0.60	0.60	0.59	0.58	0.57	0.58	0.57	0.57	0.57	0.56
D2-2	0.59	0.58	0.58	0.58	0.59	0.60	0.59	0.59	0.60	0.61	0.60	0.60	0.60	0.59	0.58	0.57	0.58	0.57	0.57	0.57	0.56

Figure 22. Trend of *FAC2* to WSS. *L* refers to the distance between virtual point and fan. Color scale was applied to the whole *FAC2* data set: red refers to greater value, green refers to smaller values, and the values inside each cell are *FAC2*.

L[m]	0.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0
A1-2	0.51	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59
A2-2	0.50	0.59	0.61	0.60	0.60	0.60	0.60	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59	0.59
B1-2	0.55	0.61	0.60	0.60	0.59	0.60	0.60	0.60	0.61	0.61	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59
B2-2	0.55	0.61	0.60	0.60	0.59	0.60	0.60	0.60	0.61	0.61	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59
C1-2	0.58	0.60	0.59	0.58	0.60	0.60	0.60	0.60	0.60	0.61	0.62	0.61	0.61	0.60	0.60	0.60	0.60	0.59	0.60	0.58	0.57
C2-2	0.57	0.61	0.59	0.59	0.60	0.60	0.60	0.59	0.60	0.60	0.61	0.60	0.61	0.60	0.60	0.60	0.60	0.59	0.59	0.58	0.57
D1-2	0.59	0.58	0.58	0.58	0.59	0.60	0.59	0.59	0.60	0.61	0.60	0.60	0.60	0.59	0.58	0.57	0.58	0.57	0.57	0.57	0.56
D2-2	0.59	0.58	0.58	0.58	0.59	0.60	0.59	0.59	0.60	0.61	0.60	0.60	0.60	0.59	0.58	0.57	0.58	0.57	0.57	0.57	0.56

Figure 23. Trend of optimal *L* to WSS. *L* refers to the distance between virtual point and fan. Color scale was applied to each row separately: red refers to greater value, green refers to smaller values, and the values inside each cell are *FAC2*.

Sensitivity of model-predicted concentration of each sampler in terms of WSS was also evaluated. The steps of evaluation were including: (1) use “A1-2 scenario and *L* = 6.6 m” combination as the reference condition, for each sampler, the model-predicted concentrations of “A1-2 scenario and *L* = 6.6 m” were compared with the model-predicted concentrations of other conditions (WSS and *L* ranged from 5.4 m to 8.4 m); (2) since the concentration range was from 20 µg/L to 1000 µg/L, to eliminate the influence of magnitude, ratio of difference was defined as:

$$R = \frac{\Delta}{C_{Sn}^{\mathrm{A1-2|6.6m}}} \qquad \text{(Eq. 16)}$$

where $C_{Sn}^{\text{A1−2|6.6m}}$ was model-predicted concentration of sampler Sn under condition of "A1-2 and L = 6.6 m"; Δ was the difference between a model-predicted concentration of a sampler under wind speed scenario or *L* of interest, noted as $C_{Sn}^{\text{MET}|L}$, and reference concentration of the same point under the reference condition, noted as $C_{Sn}^{\text{A1−2|6.6m}}$, and given as:

$$\Delta = \left|C_{Sn}^{\text{MET}|L} - C_{Sn}^{\text{A1−2|6.6m}}\right| \qquad \text{(Eq. 17)}$$

Taking absolute value was to eliminate the situation that positive values and negative values were cancelled out. *R* of eight experiments was analyzed, the results were shown below in **Figure 24.**

Figure 24 indicated that *R* of every sampler of PM had lower values than NH_3, and that model-predicted PM concentration was less sensitive to the change of WSS, and wind speed. For both plots, since T1-1 was the reference point, it was zero. T1-2 sampler had greater sensitivity compared with other samplers for both NH_3 (mean = 28.5%, median = 31.1%) and PM (mean = 12.9%, median = 17%), but PM had lower sensitivity than NH_3 at T1-2. This was probably because T1-2 was close to releasing point, and a small change of *L* could greatly influence the ratio of T1-2 and T1-1. For T1-3, PM samplers had electronic issues. For NH_3, it had a very large maximum ratio of difference up to 251.5%, this was from D5. Except this point, sensitivity of other samplers was small. The medium of T1-3 was 3.2% but mean of T1-3 was up to 20.5%, the large increase of mean was caused by the maximum. Therefore, median would be more representative than mean. T1-2 and T1-3 had large variation among other samplers. Interestingly, T1-4 was not sensitive to WSS or *L*. This was probably because T1-4 was at 10 m height, the model-predicted plume was hardly to reach that height, so T1-4 was in the blind zone of the plume. For T2 samplers, they were relatively not sensitive, the maximum value was less than 50% for both NH_3 and PM. The mean values were even lower than 12%. For T3, S1, S2, S3 and S4 samplers, they also had very small sensitivities. Therefore, this model prediction was expected to have a greater sensitivity of sampler which is close and at lower height, but for 20 m and 40 m samplers, they were not sensitive.

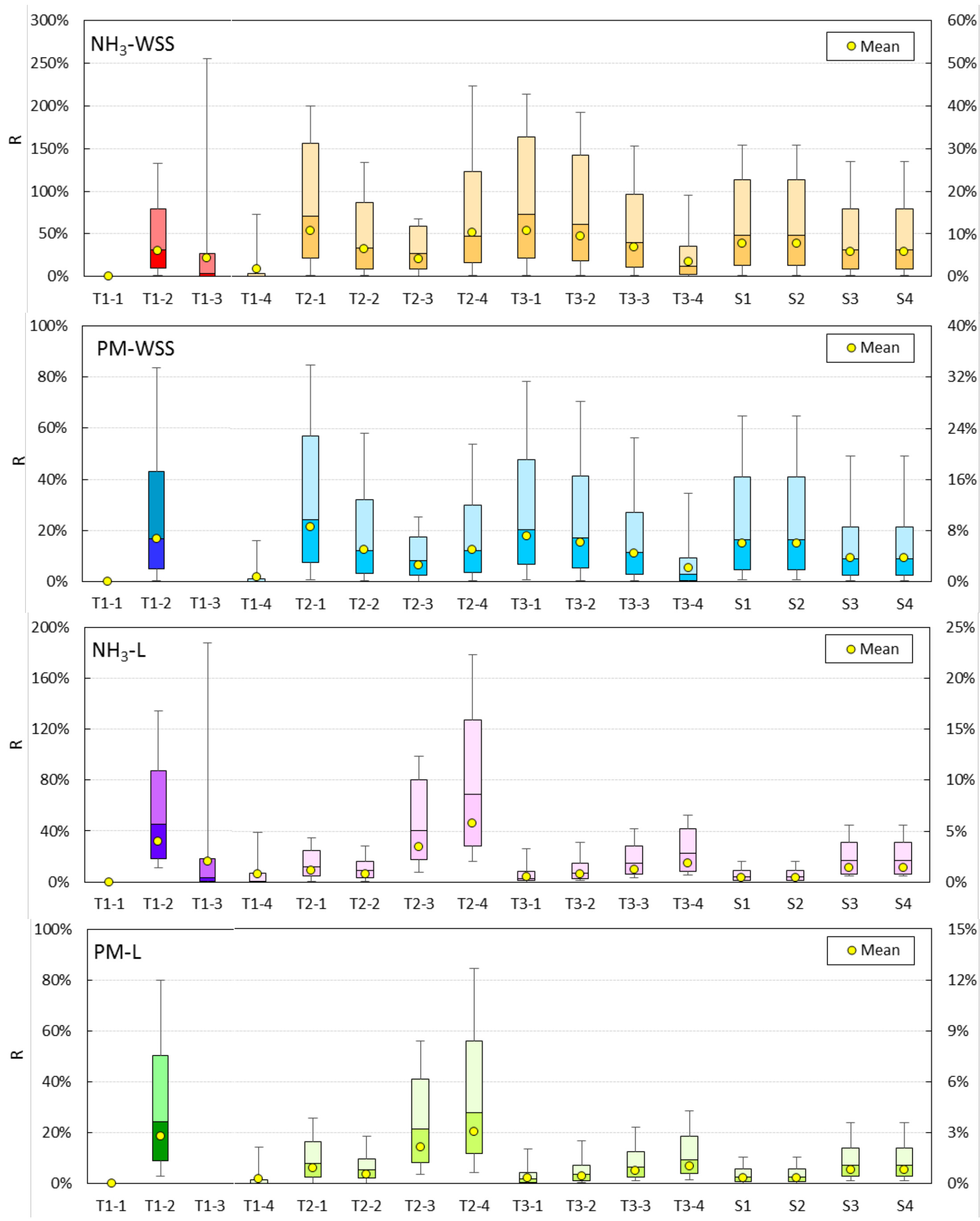


Figure 24. Box plot of ratio of difference of each sampler of NH_3 and PM (40m). Each plot has a primary axis (at the left) and a secondary axis (at the right). For T1-1, T1-2 and T1-3 (they are deeply colored), take primary axis as reference; for the rest of samplers (they are lightly colored), take secondary axis as reference. NH_3-WSS (top left): sensitivity of NH_3 prediction under different wind speed scenario; NH_3-L (top right): sensitivity of NH_3 prediction under different distance between virtual point and fan; PM-WSS (bottom left): sensitivity of PM prediction under different wind speed scenario; PM-L (bottom right): sensitivity of PM prediction under different distance between virtual point and fan. T1-3 sampler of PM had electronic issues, so no data was shown.

Chapter 5: Conclusions

This modified GPM was able to address emissions from an exhaust tunnel fan and at a small-scale situation. The model performed well for both NH_3 (median: d=0.09, F =1.35; median: d =0.12, F =1.47) and PM (median: d=0.01, F =1.02; mean: d=-0.01, F =0.98). Prediction of PM was better than prediction of NH_3 by having smaller d values and smaller variability. This model could be used to assess the pollutant distribution near the farms, and it can also be used to reversely calculate the source strength of a poultry house emissions. The overall performance of the model was not sensitive to either wind speed or to L. The sensitivity of the model of each pollutant or sampler varied. NH_3 was more sensitive than PM, and T1-2, T1-3 were more sensitive than other samplers. Therefore, even though the WSS layout was different from this experiment, this modified model was able to give reliable results, especially for 20-m and 40-m samplers.

This model has his limitations by assuming that wind field in the domain was uniform, and ambient wind was negligible. However, wind velocity would change by the distance from the fan, and approaching to ambient wind velocity. Therefore, future work would be focused on reducing this oversight by taking into ambient wind into account, as well as the un-uniform patterns of wind field in the domain. For example, the domain could be divided into several sub-domains in series, and assuming in each sub-domain wind speed was uniform. In addition, further studies could be conducted to get more insight of the reflectivity of different pollutants.

Appendices

Appendix A - Tables of observed meteorological data

DE01

t	WS	T	RH	P	WD	p.air	p,wv	sample point	
date	[m/s]	[C]	[%]	[KPa]	[deg]	[Pa]	[Pa]		
5/17/15	11:00 PM	0.692	22.3	81.0	97.5	163.08	97477	2175	S1-5
5/18/15	12:00 AM	0.859	22.4	81.3	97.3	158.78	97288	2199	S1-5
5/18/15	1:00 AM	0.725	22.2	81.6	97.3	180.01	97261	2188	S1-5
5/18/15	2:00 AM	0.778	21.7	82.2	97.4	199.56	97359	2132	S1-5
5/18/15	3:00 AM	0.495	21.5	83.0	97.5	164.90	97498	2125	S1-5
5/18/15	4:00 AM	0.459	21.5	83.6	97.4	158.87	97417	2148	S1-5
5/18/15	5:00 AM	0.371	21.8	83.8	97.3	166.67	97285	2194	S1-5
5/18/15	6:00 AM	0.806	22.0	83.7	97.0	196.35	97047	2220	S1-5
5/17/15	11:00 PM	0.833	22.3	81.0	97.5	203.74	97477	2175	S1-2
5/18/15	12:00 AM	1.050	22.4	81.3	97.3	205.07	97288	2199	S1-2
5/18/15	1:00 AM	0.554	22.2	81.6	97.3	186.97	97261	2188	S1-2
5/18/15	2:00 AM	0.309	21.7	82.2	97.4	173.26	97359	2132	S1-2
5/18/15	3:00 AM	0.626	21.5	83.0	97.5	207.98	97498	2125	S1-2
5/18/15	4:00 AM	0.693	21.5	83.6	97.4	206.12	97417	2148	S1-2
5/18/15	5:00 AM	0.312	21.8	83.8	97.3	231.70	97285	2194	S1-2
5/18/15	6:00 AM	0.339	22.0	83.7	97.0	178.86	97047	2220	S1-2
5/17/15	11:00 PM	1.034	22.3	81.0	97.5	207.97	97477	2175	S1-3
5/18/15	12:00 AM	1.250	22.4	81.3	97.3	208.64	97288	2199	S1-3
5/18/15	1:00 AM	0.779	22.2	81.6	97.3	193.96	97261	2188	S1-3
5/18/15	2:00 AM	0.732	21.7	82.2	97.4	182.43	97359	2132	S1-3
5/18/15	3:00 AM	1.214	21.5	83.0	97.5	206.29	97498	2125	S1-3
5/18/15	4:00 AM	1.403	21.5	83.6	97.4	205.46	97417	2148	S1-3
5/18/15	5:00 AM	0.432	21.8	83.8	97.3	222.42	97285	2194	S1-3
5/18/15	6:00 AM	0.382	22.0	83.7	97.0	202.96	97047	2220	S1-3
5/17/15	11:00 PM	0.268	22.3	81.0	97.5	180.30	97477	2175	S1-4
5/18/15	12:00 AM	0.268	22.4	81.3	97.3	180.30	97288	2199	S1-4
5/18/15	1:00 AM	0.268	22.2	81.6	97.3	180.16	97261	2188	S1-4
5/18/15	2:00 AM	0.268	21.7	82.2	97.4	180.25	97359	2132	S1-4
5/18/15	3:00 AM	0.268	21.5	83.0	97.5	180.30	97498	2125	S1-4
5/18/15	4:00 AM	0.268	21.5	83.6	97.4	180.30	97417	2148	S1-4
5/18/15	5:00 AM	0.268	21.8	83.8	97.3	180.30	97285	2194	S1-4
5/18/15	6:00 AM	0.268	22.0	83.7	97.0	180.30	97047	2220	S1-4
5/17/15	11:00 PM	2.652	22.7	100.0	97.4	137.13	97390	2755	S2-5
5/18/15	12:00 AM	2.476	22.6	100.0	97.3	138.06	97254	2747	S2-5
5/18/15	1:00 AM	2.644	22.2	100.0	97.4	127.86	97376	2673	S2-5
5/18/15	2:00 AM	2.459	21.3	100.0	97.7	123.01	97749	2536	S2-5
5/18/15	3:00 AM	2.759	21.4	100.0	98.0	127.31	97995	2547	S2-5
5/18/15	4:00 AM	2.818	21.4	100.0	98.0	121.73	98004	2545	S2-5
5/18/15	5:00 AM	2.938	21.7	100.0	97.8	136.08	97844	2592	S2-5
5/18/15	6:00 AM	2.414	21.8	100.0	97.6	125.64	97595	2613	S2-5
5/17/15	11:00 PM		22.8	81.1	97.7		97725	2252	S2-1R
5/18/15	12:00 AM		22.7	81.9	97.3		97342	2262	S2-1R
5/18/15	1:00 AM		22.4	84.2	97.5		97476	2284	S2-1R
5/18/15	2:00 AM		21.6	87.0	97.8		97808	2248	S2-1R
5/18/15	3:00 AM		21.6	88.4	98.0		97957	2280	S2-1R
5/18/15	4:00 AM		21.5	89.7	97.9		97864	2306	S2-1R
5/18/15	5:00 AM		21.9	89.6	97.7		97740	2348	S2-1R
5/18/15	6:00 AM		22.0	89.0	97.5		97503	2361	S2-1R

5/17/15 11:00 PM	1.559	22.7	100.0	97.4	203.30	97390	2755	S2-2
5/18/15 12:00 AM	1.804	22.6	100.0	97.3	198.76	97254	2747	S2-2
5/18/15 1:00 AM	1.635	22.2	100.0	97.4	195.84	97376	2673	S2-2
5/18/15 2:00 AM	1.861	21.3	100.0	97.7	191.89	97749	2536	S2-2
5/18/15 3:00 AM	1.764	21.4	100.0	98.0	191.06	97995	2547	S2-2
5/18/15 4:00 AM	1.910	21.4	100.0	98.0	191.06	98004	2545	S2-2
5/18/15 5:00 AM	1.475	21.7	100.0	97.8	196.54	97844	2592	S2-2
5/18/15 6:00 AM	1.840	21.8	100.0	97.6	187.92	97595	2613	S2-2
5/17/15 11:00 PM	1.018	22.7	100.0	97.4	198.23	97390	2755	S2-3
5/18/15 12:00 AM	1.150	22.6	100.0	97.3	189.10	97254	2747	S2-3
5/18/15 1:00 AM	0.806	22.2	100.0	97.4	177.78	97376	2673	S2-3
5/18/15 2:00 AM	0.814	21.3	100.0	97.7	161.54	97749	2536	S2-3
5/18/15 3:00 AM	0.843	21.4	100.0	98.0	195.47	97995	2547	S2-3
5/18/15 4:00 AM	0.979	21.4	100.0	98.0	189.96	98004	2545	S2-3
5/18/15 5:00 AM	0.848	21.7	100.0	97.8	203.61	97844	2592	S2-3
5/18/15 6:00 AM	0.508	21.8	100.0	97.6	178.73	97595	2613	S2-3
5/17/15 11:00 PM	1.440	22.7	100.0	97.4	198.36	97390	2755	S2-4
5/18/15 12:00 AM	1.614	22.6	100.0	97.3	194.77	97254	2747	S2-4
5/18/15 1:00 AM	0.863	22.2	100.0	97.4	183.01	97376	2673	S2-4
5/18/15 2:00 AM	0.820	21.3	100.0	97.7	167.41	97749	2536	S2-4
5/18/15 3:00 AM	1.148	21.4	100.0	98.0	201.23	97995	2547	S2-4
5/18/15 4:00 AM	1.351	21.4	100.0	98.0	188.15	98004	2545	S2-4
5/18/15 5:00 AM	1.207	21.7	100.0	97.8	201.72	97844	2592	S2-4
5/18/15 6:00 AM	0.686	21.8	100.0	97.6	184.43	97595	2613	S2-4
5/17/15 11:00 PM		22.4	90.0	97.5		97546	2443	S3
5/18/15 12:00 AM		22.3	91.1	97.0		97034	2462	S3
5/18/15 1:00 AM		22.1	95.2	97.1		97068	2538	S3
5/18/15 2:00 AM		21.5	99.2	97.4		97353	2550	S3
5/18/15 3:00 AM		21.1	100.0	97.7		97715	2505	S3
5/18/15 4:00 AM		21.1	100.0	97.4		97413	2501	S3
5/18/15 5:00 AM		21.2	100.0	97.1		97115	2524	S3
5/18/15 6:00 AM		21.8	100.0	96.9		96941	2611	S3
5/17/15 11:00 PM		22.8	83.7	98.0		98000	2317	S4
5/18/15 12:00 AM		22.6	86.0	97.3		97294	2361	S4
5/18/15 1:00 AM		22.0	91.5	97.4		97405	2424	S4
5/18/15 2:00 AM		20.8	97.6	97.6		97552	2404	S4
5/18/15 3:00 AM		21.3	100.0	97.5		97459	2535	S4
5/18/15 4:00 AM		21.2	100.0	97.6		97565	2520	S4
5/18/15 5:00 AM		21.5	100.0	97.5		97464	2570	S4
5/18/15 6:00 AM		21.2	99.7	97.1		97093	2518	S4
5/17/15 11:00 PM	0.565	21.8	79.7	97.3	172.31	97269	2076	S5-5
5/18/15 12:00 AM	0.488	21.6	80.4	96.5	151.74	96533	2073	S5-5
5/18/15 1:00 AM	0.806	21.2	83.0	96.0	174.55	95991	2086	S5-5
5/18/15 2:00 AM	0.732	20.2	86.1	96.2	174.68	96212	2045	S5-5
5/18/15 3:00 AM	0.540	20.2	87.5	96.5	174.92	96536	2077	S5-5
5/18/15 4:00 AM	0.436	20.1	88.4	96.2	137.77	96228	2075	S5-5
5/18/15 5:00 AM	0.803	20.4	88.2	95.8	162.40	95799	2117	S5-5
5/18/15 6:00 AM	0.695	20.6	87.9	95.7	180.32	95726	2140	S5-5
5/17/15 11:00 PM	1.152	21.8	79.7	97.3	160.39	97269	2076	S5-2
5/18/15 12:00 AM	1.271	21.6	80.4	96.5	182.94	96533	2073	S5-2
5/18/15 1:00 AM	1.274	21.2	83.0	96.0	144.76	95991	2086	S5-2
5/18/15 2:00 AM	1.104	20.2	86.1	96.2	142.87	96212	2045	S5-2
5/18/15 3:00 AM	1.109	20.2	87.5	96.5	162.56	96536	2077	S5-2
5/18/15 4:00 AM	0.972	20.1	88.4	96.2	201.75	96228	2075	S5-2
5/18/15 5:00 AM	1.104	20.4	88.2	95.8	168.12	95799	2117	S5-2

5/18/15 6:00 AM	0.992	20.6	87.9	95.7	148.79	95726	2140	S5-2
5/17/15 11:00 PM	1.087	21.8	79.7	97.3	184.75	97269	2076	S5-3
5/18/15 12:00 AM	1.518	21.6	80.4	96.5	193.63	96533	2073	S5-3
5/18/15 1:00 AM	1.228	21.2	83.0	96.0	148.45	95991	2086	S5-3
5/18/15 2:00 AM	1.010	20.2	86.1	96.2	149.16	96212	2045	S5-3
5/18/15 3:00 AM	1.108	20.2	87.5	96.5	169.39	96536	2077	S5-3
5/18/15 4:00 AM	1.160	20.1	88.4	96.2	198.84	96228	2075	S5-3
5/18/15 5:00 AM	1.013	20.4	88.2	95.8	179.97	95799	2117	S5-3
5/18/15 6:00 AM	0.758	20.6	87.9	95.7	174.86	95726	2140	S5-3
5/17/15 11:00 PM	1.126	21.8	79.7	97.3	192.74	97269	2076	S5-4
5/18/15 12:00 AM	1.630	21.6	80.4	96.5	194.47	96533	2073	S5-4
5/18/15 1:00 AM	0.996	21.2	83.0	96.0	163.64	95991	2086	S5-4
5/18/15 2:00 AM	0.833	20.2	86.1	96.2	163.38	96212	2045	S5-4
5/18/15 3:00 AM	0.984	20.2	87.5	96.5	180.74	96536	2077	S5-4
5/18/15 4:00 AM	1.288	20.1	88.4	96.2	196.96	96228	2075	S5-4
5/18/15 5:00 AM	0.982	20.4	88.2	95.8	193.60	95799	2117	S5-4
5/18/15 6:00 AM	0.628	20.6	87.9	95.7	187.87	95726	2140	S5-4
5/17/15 11:00 PM		22.1	81.8	97.6		97649	2172	S6
5/18/15 12:00 AM		21.9	82.2	96.5		96474	2160	S6
5/18/15 1:00 AM		21.6	84.9	96.5		96490	2191	S6
5/18/15 2:00 AM		20.8	88.1	97.1		97090	2167	S6
5/18/15 3:00 AM		20.5	90.8	97.2		97208	2192	S6
5/18/15 4:00 AM		20.4	92.1	96.8		96848	2211	S6
5/18/15 5:00 AM		20.5	92.6	96.2		96212	2236	S6
5/18/15 6:00 AM		21.4	91.0	96.4		96404	2319	S6
5/17/15 11:00 PM								S7
5/18/15 12:00 AM								S7
5/18/15 1:00 AM								S7
5/18/15 2:00 AM								S7
5/18/15 3:00 AM								S7
5/18/15 4:00 AM								S7
5/18/15 5:00 AM								S7
5/18/15 6:00 AM								S7

DE02

t	WS	T	RH	P	WD	p.air	p,wv	sample point
date	[m/s]	[C]	[%]	[KPa]	[deg]	[Pa]	[Pa]	
5/18/15 8:30 PM	2.629	22.7	86.3	98.3	206.25	98338	2380	S1-5
5/18/15 9:30 PM	2.515	21.2	86.2	98.2	207.12	98185	2165	S1-5
5/18/15 10:30 PM	2.404	20.7	86.5	97.7	208.24	97723	2110	S1-5
5/18/15 11:30 PM	2.018	20.5	86.7	97.8	206.52	97757	2092	S1-5
5/19/15 12:30 AM	1.686	20.6	86.8	97.6	196.61	97562	2104	S1-5
5/19/15 1:30 AM	1.920	20.9	86.9	97.3	194.33	97344	2150	S1-5
5/19/15 2:30 AM	2.005	20.7	88.6	97.4	195.88	97443	2168	S1-5
5/19/15 3:30 AM	2.562	20.8	89.3	97.5	207.74	97459	2193	S1-5
5/19/15 4:30 AM	2.361	20.8	88.7	97.3	208.37	97317	2183	S1-5
5/19/15 5:30 AM	1.368	21.1	87.5	97.1	179.32	97131	2186	S1-5
5/19/15 6:30 AM	1.800	21.2	86.9	96.9	175.18	96903	2195	S1-5
5/18/15 8:30 PM	2.147	22.7	86.3	98.3	149.41	98338	2380	S1-2
5/18/15 9:30 PM	2.498	21.2	86.2	98.2	44.66	98185	2165	S1-2
5/18/15 10:30 PM	2.022	20.7	86.5	97.7	42.09	97723	2110	S1-2
5/18/15 11:30 PM	1.420	20.5	86.7	97.8	41.32	97757	2092	S1-2
5/19/15 12:30 AM	0.801	20.6	86.8	97.6	41.03	97562	2104	S1-2
5/19/15 1:30 AM	1.533	20.9	86.9	97.3	41.48	97344	2150	S1-2
5/19/15 2:30 AM	1.612	20.7	88.6	97.4	41.30	97443	2168	S1-2
5/19/15 3:30 AM	2.033	20.8	89.3	97.5	41.55	97459	2193	S1-2
5/19/15 4:30 AM	2.176	20.8	88.7	97.3	41.44	97317	2183	S1-2

5/19/15 5:30 AM	1.126	21.1	87.5	97.1	41.53	97131	2186	S1-2
5/19/15 6:30 AM	2.078	21.2	86.9	96.9	40.65	96903	2195	S1-2
5/18/15 8:30 PM	2.483	22.7	86.3	98.3	145.74	98338	2380	S1-3
5/18/15 9:30 PM	2.479	21.2	86.2	98.2	152.74	98185	2165	S1-3
5/18/15 10:30 PM	2.028	20.7	86.5	97.7	143.53	97723	2110	S1-3
5/18/15 11:30 PM	1.596	20.5	86.7	97.8	144.21	97757	2092	S1-3
5/19/15 12:30 AM	1.435	20.6	86.8	97.6	169.05	97562	2104	S1-3
5/19/15 1:30 AM	1.693	20.9	86.9	97.3	179.38	97344	2150	S1-3
5/19/15 2:30 AM	1.646	20.7	88.6	97.4	176.63	97443	2168	S1-3
5/19/15 3:30 AM	2.133	20.8	89.3	97.5	176.03	97459	2193	S1-3
5/19/15 4:30 AM	2.023	20.8	88.7	97.3	170.27	97317	2183	S1-3
5/19/15 5:30 AM	1.398	21.1	87.5	97.1	233.93	97131	2186	S1-3
5/19/15 6:30 AM	2.922	21.2	86.9	96.9	243.93	96903	2195	S1-3
5/18/15 8:30 PM	0.268	22.7	86.3	98.3	180.29	98338	2380	S1-4
5/18/15 9:30 PM	0.268	21.2	86.2	98.2	180.29	98185	2165	S1-4
5/18/15 10:30 PM	0.268	20.7	86.5	97.7	180.29	97723	2110	S1-4
5/18/15 11:30 PM	0.268	20.5	86.7	97.8	180.29	97757	2092	S1-4
5/19/15 12:30 AM	0.268	20.6	86.8	97.6	180.30	97562	2104	S1-4
5/19/15 1:30 AM	0.268	20.9	86.9	97.3	180.28	97344	2150	S1-4
5/19/15 2:30 AM	0.268	20.7	88.6	97.4	180.28	97443	2168	S1-4
5/19/15 3:30 AM	0.268	20.8	89.3	97.5	180.25	97459	2193	S1-4
5/19/15 4:30 AM	0.268	20.8	88.7	97.3	180.29	97317	2183	S1-4
5/19/15 5:30 AM	0.268	21.1	87.5	97.1	180.30	97131	2186	S1-4
5/19/15 6:30 AM	0.268	21.2	86.9	96.9	180.30	96903	2195	S1-4
5/18/15 8:30 PM	1.645	21.8	100.0	98.1	141.01	98080	2606	S2-5
5/18/15 9:30 PM	1.804	20.1	100.0	98.1	147.26	98091	2360	S2-5
5/18/15 10:30 PM	1.171	19.6	100.0	97.9	139.96	97889	2284	S2-5
5/18/15 11:30 PM	1.185	19.5	100.0	97.8	139.11	97840	2265	S2-5
5/19/15 12:30 AM	2.045	19.9	100.0	97.8	138.30	97813	2329	S2-5
5/19/15 1:30 AM	1.163	20.0	100.0	97.8	147.06	97778	2342	S2-5
5/19/15 2:30 AM	1.125	20.0	100.0	97.6	162.11	97605	2339	S2-5
5/19/15 3:30 AM	0.553	19.7	100.0	97.6	171.23	97601	2292	S2-5
5/19/15 4:30 AM	0.526	19.6	100.0	97.3	169.91	97280	2285	S2-5
5/19/15 5:30 AM	2.488	20.3	100.0	97.1	137.73	97098	2379	S2-5
5/19/15 6:30 AM	2.276	20.2	100.0	97.8	192.65	97770	2365	S2-5
5/18/15 8:30 PM		21.9	89.2	98.0		98009	2342	S2-1R
5/18/15 9:30 PM		20.3	89.6	98.2		98201	2140	S2-1R
5/18/15 10:30 PM		19.8	92.0	98.3		98310	2124	S2-1R
5/18/15 11:30 PM		19.6	93.6	98.1		98083	2141	S2-1R
5/19/15 12:30 AM		20.1	93.9	98.0		98008	2216	S2-1R
5/19/15 1:30 AM		20.2	94.0	97.8		97829	2233	S2-1R
5/19/15 2:30 AM		20.2	96.5	97.8		97760	2280	S2-1R
5/19/15 3:30 AM		19.9	98.1	97.7		97704	2280	S2-1R
5/19/15 4:30 AM		19.8	98.4	97.3		97340	2276	S2-1R
5/19/15 5:30 AM		20.4	97.7	97.4		97437	2339	S2-1R
5/19/15 6:30 AM		20.2	97.8	97.7		97737	2317	S2-1R
5/18/15 8:30 PM	1.021	21.8	100.0	98.1	213.28	98080	2606	S2-2
5/18/15 9:30 PM	1.544	20.1	100.0	98.1	220.31	98091	2360	S2-2
5/18/15 10:30 PM	1.268	19.6	100.0	97.9	209.33	97889	2284	S2-2
5/18/15 11:30 PM	1.151	19.5	100.0	97.8	141.33	97840	2265	S2-2
5/19/15 12:30 AM	1.324	19.9	100.0	97.8	155.32	97813	2329	S2-2
5/19/15 1:30 AM	0.994	20.0	100.0	97.8	204.91	97778	2342	S2-2
5/19/15 2:30 AM	1.113	20.0	100.0	97.6	196.11	97605	2339	S2-2
5/19/15 3:30 AM	1.035	19.7	100.0	97.6	207.09	97601	2292	S2-2
5/19/15 4:30 AM	1.223	19.6	100.0	97.3	216.28	97280	2285	S2-2
5/19/15 5:30 AM	1.450	20.3	100.0	97.1	192.81	97098	2379	S2-2
5/19/15 6:30 AM	1.626	20.2	100.0	97.8	209.57	97770	2365	S2-2

5/18/15 8:30 PM	1.993	21.8	100.0	98.1	142.06	98080	2606	S2-3
5/18/15 9:30 PM	2.263	20.1	100.0	98.1	149.27	98091	2360	S2-3
5/18/15 10:30 PM	1.402	19.6	100.0	97.9	137.33	97889	2284	S2-3
5/18/15 11:30 PM	1.102	19.5	100.0	97.8	140.03	97840	2265	S2-3
5/19/15 12:30 AM	0.949	19.9	100.0	97.8	173.82	97813	2329	S2-3
5/19/15 1:30 AM	0.908	20.0	100.0	97.8	161.47	97778	2342	S2-3
5/19/15 2:30 AM	0.992	20.0	100.0	97.6	177.44	97605	2339	S2-3
5/19/15 3:30 AM	1.251	19.7	100.0	97.6	170.46	97601	2292	S2-3
5/19/15 4:30 AM	1.339	19.6	100.0	97.3	170.06	97280	2285	S2-4
5/19/15 5:30 AM	0.564	20.3	100.0	97.1	213.97	97098	2379	S2-5
5/19/15 6:30 AM	1.709	20.2	100.0	97.8	242.28	97770	2365	S2-6
5/18/15 8:30 PM	2.472	21.8	100.0	98.1	141.98	98080	2606	S2-4
5/18/15 9:30 PM	2.723	20.1	100.0	98.1	146.94	98091	2360	S2-4
5/18/15 10:30 PM	1.899	19.6	100.0	97.9	140.04	97889	2284	S2-4
5/18/15 11:30 PM	1.516	19.5	100.0	97.8	139.18	97840	2265	S2-4
5/19/15 12:30 AM	1.208	19.9	100.0	97.8	173.00	97813	2329	S2-4
5/19/15 1:30 AM	1.312	20.0	100.0	97.8	157.00	97778	2342	S2-4
5/19/15 2:30 AM	1.318	20.0	100.0	97.6	181.45	97605	2339	S2-4
5/19/15 3:30 AM	1.735	19.7	100.0	97.6	168.24	97601	2292	S2-4
5/19/15 4:30 AM	1.750	19.6	100.0	97.3	170.02	97280	2285	S2-5
5/19/15 5:30 AM	0.960	20.3	100.0	97.1	210.09	97098	2379	S2-6
5/19/15 6:30 AM	2.308	20.2	100.0	97.8	243.18	97770	2365	S2-7
5/18/15 8:30 PM		21.9	100.0	97.5		97550	2630	S3
5/18/15 9:30 PM		20.1	100.0	97.8		97803	2349	S3
5/18/15 10:30 PM		19.7	100.0	98.0		97968	2301	S3
5/18/15 11:30 PM		19.7	100.0	98.0		98009	2295	S3
5/19/15 12:30 AM		19.9	100.0	97.9		97932	2328	S3
5/19/15 1:30 AM		20.2	100.0	97.6		97616	2364	S3
5/19/15 2:30 AM		19.9	100.0	97.6		97609	2332	S3
5/19/15 3:30 AM		19.7	100.0	97.7		97668	2300	S3
5/19/15 4:30 AM		19.6	100.0	97.4		97408	2279	S3
5/19/15 5:30 AM		19.7	100.0	97.4		97429	2290	S3
5/19/15 6:30 AM		19.4	100.0	97.1		97116	2254	S3
5/18/15 8:30 PM		21.7	100.0	98.2		98151	2591	S4
5/18/15 9:30 PM		20.1	100.0	98.2		98234	2347	S4
5/18/15 10:30 PM		19.4	100.0	98.3		98257	2259	S4
5/18/15 11:30 PM		19.3	100.0	98.2		98174	2233	S4
5/19/15 12:30 AM		19.7	100.0	97.7		97669	2294	S4
5/19/15 1:30 AM		19.8	100.0	97.4		97440	2308	S4
5/19/15 2:30 AM		19.9	100.0	97.8		97766	2329	S4
5/19/15 3:30 AM		19.6	100.0	98.0		98006	2278	S4
5/19/15 4:30 AM		19.5	100.0	97.7		97653	2269	S5
5/19/15 5:30 AM		20.0	100.0	97.5		97514	2338	S6
5/19/15 6:30 AM		20.5	100.0	97.7		97736	2406	S7
5/18/15 8:30 PM	1.915	21.1	87.8	97.8	228.68	97753	2192	S5-5
5/18/15 9:30 PM	1.679	19.5	88.1	97.6	241.33	97585	1999	S5-5
5/18/15 10:30 PM	1.249	18.9	89.1	97.5	229.20	97526	1948	S5-5
5/18/15 11:30 PM	0.952	18.8	89.5	97.2	219.14	97220	1939	S5-5
5/19/15 12:30 AM	0.698	19.0	89.5	96.9	204.33	96853	1971	S5-5
5/19/15 1:30 AM	0.751	19.3	89.7	96.5	226.63	96496	2014	S5-5
5/19/15 2:30 AM	0.504	19.3	90.4	96.3	187.69	96258	2024	S5-5
5/19/15 3:30 AM	0.716	19.1	92.0	96.6	174.73	96606	2031	S5-5
5/19/15 4:30 AM	0.766	19.0	92.2	96.6	170.16	96606	2029	S5-5
5/19/15 5:30 AM	0.462	18.8	92.1	96.5	175.89	96502	2001	S5-5
5/19/15 6:30 AM	0.965	19.0	92.3	96.2	180.55	96192	2029	S5-5
5/18/15 8:30 PM	1.894	21.1	87.8	97.8	137.40	97753	2192	S5-2

5/18/15 9:30 PM	2.097	19.5	88.1	97.6	146.72	97585	1999	S5-2
5/18/15 10:30 PM	1.402	18.9	89.1	97.5	139.63	97526	1948	S5-2
5/18/15 11:30 PM	1.059	18.8	89.5	97.2	130.80	97220	1939	S5-2
5/19/15 12:30 AM	1.014	19.0	89.5	96.9	153.22	96853	1971	S5-2
5/19/15 1:30 AM	0.989	19.3	89.7	96.5	155.87	96496	2014	S5-2
5/19/15 2:30 AM	0.925	19.3	90.4	96.3	182.73	96258	2024	S5-2
5/19/15 3:30 AM	1.358	19.1	92.0	96.6	174.17	96606	2031	S5-2
5/19/15 4:30 AM	1.374	19.0	92.2	96.6	174.33	96606	2029	S5-2
5/19/15 5:30 AM	0.539	18.8	92.1	96.5	204.02	96502	2001	S5-2
5/19/15 6:30 AM	1.485	19.0	92.3	96.2	239.14	96192	2029	S5-2
5/18/15 8:30 PM	2.235	21.1	87.8	97.8	140.68	97753	2192	S5-3
5/18/15 9:30 PM	2.568	19.5	88.1	97.6	153.81	97585	1999	S5-3
5/18/15 10:30 PM	1.732	18.9	89.1	97.5	147.56	97526	1948	S5-3
5/18/15 11:30 PM	1.370	18.8	89.5	97.2	143.48	97220	1939	S5-3
5/19/15 12:30 AM	1.271	19.0	89.5	96.9	159.91	96853	1971	S5-3
5/19/15 1:30 AM	1.384	19.3	89.7	96.5	160.55	96496	2014	S5-3
5/19/15 2:30 AM	1.352	19.3	90.4	96.3	186.33	96258	2024	S5-3
5/19/15 3:30 AM	1.683	19.1	92.0	96.6	175.73	96606	2031	S5-3
5/19/15 4:30 AM	1.694	19.0	92.2	96.6	174.41	96606	2029	S5-3
5/19/15 5:30 AM	0.996	18.8	92.1	96.5	223.90	96502	2001	S5-3
5/19/15 6:30 AM	2.152	19.0	92.3	96.2	242.02	96192	2029	S5-3
5/18/15 8:30 PM	2.746	21.1	87.8	97.8	140.89	97753	2192	S5-4
5/18/15 9:30 PM	2.835	19.5	88.1	97.6	153.28	97585	1999	S5-4
5/18/15 10:30 PM	2.001	18.9	89.1	97.5	142.22	97526	1948	S5-4
5/18/15 11:30 PM	1.618	18.8	89.5	97.2	144.42	97220	1939	S5-4
5/19/15 12:30 AM	1.361	19.0	89.5	96.9	157.13	96853	1971	S5-4
5/19/15 1:30 AM	1.521	19.3	89.7	96.5	160.04	96496	2014	S5-4
5/19/15 2:30 AM	1.502	19.3	90.4	96.3	181.78	96258	2024	S5-4
5/19/15 3:30 AM	1.826	19.1	92.0	96.6	172.88	96606	2031	S5-4
5/19/15 4:30 AM	1.839	19.0	92.2	96.6	171.58	96606	2029	S5-4
5/19/15 5:30 AM	1.198	18.8	92.1	96.5	211.44	96502	2001	S5-4
5/19/15 6:30 AM	2.573	19.0	92.3	96.2	240.54	96192	2029	S5-4
5/18/15 8:30 PM		21.4	90.4	98.1		98075	2310	S6
5/18/15 9:30 PM		19.9	90.9	98.2		98200	2111	S6
5/18/15 10:30 PM		19.3	92.3	98.1		98129	2068	S6
5/18/15 11:30 PM		19.1	93.3	98.0		98031	2067	S6
5/19/15 12:30 AM		19.4	94.3	97.5		97545	2120	S6
5/19/15 1:30 AM		19.5	95.2	97.4		97353	2165	S6
5/19/15 2:30 AM		19.5	96.2	97.2		97236	2175	S6
5/19/15 3:30 AM		19.3	98.3	97.5		97473	2208	S6
5/19/15 4:30 AM		19.3	99.3	97.2		97164	2222	S6
5/19/15 5:30 AM		19.1	99.9	96.8		96840	2208	S6
5/19/15 6:30 AM		19.2	100.0	96.6		96599	2220	S6
5/18/15 8:30 PM								S7
5/18/15 9:30 PM								S7
5/18/15 10:30 PM								S7
5/18/15 11:30 PM								S7
5/19/15 12:30 AM								S7
5/19/15 1:30 AM								S7
5/19/15 2:30 AM								S7
5/19/15 3:30 AM								S7
5/19/15 4:30 AM								S7
5/19/15 5:30 AM								S7
5/19/15 6:30 AM								S7

DE03

t	WS	T	RH	P	WD	p.air	p,wv	sample point
date	[m/s]	[C]	[%]	[KPa]	[deg]	[Pa]	[Pa]	

5/19/15 8:30 AM	1.426	22.4	84.8	96.3	189.50	96321	2304	S1-5
5/19/15 9:30 AM	0.923	22.6	84.2	95.9	178.02	95860	2315	S1-5
5/19/15 10:30 AM	0.839	23.6	82.2	95.2	179.08	95211	2399	S1-5
5/19/15 11:30 AM	1.190	25.4	78.8	93.8	180.26	93833	2552	S1-5
5/19/15 12:30 PM	1.850	26.4	78.4	92.5	180.19	92535	2695	S1-5
5/19/15 1:30 PM	1.293	26.6	78.0	92.2	182.33	92247	2723	S1-5
5/19/15 2:30 PM	1.288	27.4	76.8	91.5	169.17	91466	2806	S1-5
5/19/15 3:30 PM	1.938	27.4	76.1	91.4	168.86	91393	2787	S1-5
5/19/15 8:30 AM	1.532	22.4	84.8	96.3	41.65	96321	2304	S1-2
5/19/15 9:30 AM	1.329	22.6	84.2	95.9	41.13	95860	2315	S1-2
5/19/15 10:30 AM	1.223	23.6	82.2	95.2	40.94	95211	2399	S1-2
5/19/15 11:30 AM	1.938	25.4	78.8	93.8	40.90	93833	2552	S1-2
5/19/15 12:30 PM	2.122	26.4	78.4	92.5	40.40	92535	2695	S1-2
5/19/15 1:30 PM	2.148	26.6	78.0	92.2	39.91	92247	2723	S1-2
5/19/15 2:30 PM		27.4	76.8	91.5	39.49	91466	2806	S1-2
5/19/15 3:30 PM		27.4	76.1	91.4	40.38	91393	2787	S1-2
5/19/15 8:30 AM	2.562	22.4	84.8	96.3	192.18	96321	2304	S1-3
5/19/15 9:30 AM	1.813	22.6	84.2	95.9	211.06	95860	2315	S1-3
5/19/15 10:30 AM	1.624	23.6	82.2	95.2	236.49	95211	2399	S1-3
5/19/15 11:30 AM	1.539	25.4	78.8	93.8	212.19	93833	2552	S1-3
5/19/15 12:30 PM	2.575	26.4	78.4	92.5	232.75	92535	2695	S1-3
5/19/15 1:30 PM	2.103	26.6	78.0	92.2	219.19	92247	2723	S1-3
5/19/15 2:30 PM	2.414	27.4	76.8	91.5	231.26	91466	2806	S1-3
5/19/15 3:30 PM	2.628	27.4	76.1	91.4	233.71	91393	2787	S1-3
5/19/15 8:30 AM	0.268	22.4	84.8	96.3	180.30	96321	2304	S1-4
5/19/15 9:30 AM	0.268	22.6	84.2	95.9	180.30	95860	2315	S1-4
5/19/15 10:30 AM	0.268	23.6	82.2	95.2	180.30	95211	2399	S1-4
5/19/15 11:30 AM	0.268	25.4	78.8	93.8	180.30	93833	2552	S1-4
5/19/15 12:30 PM	0.268	26.4	78.4	92.5	180.29	92535	2695	S1-4
5/19/15 1:30 PM	0.268	26.6	78.0	92.2	180.30	92247	2723	S1-4
5/19/15 2:30 PM	0.268	27.4	76.8	91.5	180.30	91466	2806	S1-4
5/19/15 3:30 PM	0.268	27.4	76.1	91.4	180.28	91393	2787	S1-4
5/19/15 8:30 AM	2.604	22.1	100.0	96.4	157.88	96367	2671	S2-5
5/19/15 9:30 AM	2.693	22.7	100.0	95.7	142.74	95675	2768	S2-5
5/19/15 10:30 AM	2.791	24.2	100.0	94.5	143.28	94476	3020	S2-5
5/19/15 11:30 AM	2.310	26.6	96.1	92.1	155.93	92079	3341	S2-5
5/19/15 12:30 PM	2.467	28.0	92.7	89.3	175.08	89321	3501	S2-5
5/19/15 1:30 PM	2.468	28.4	91.9	89.5	156.61	89464	3558	S2-5
5/19/15 2:30 PM	1.827	29.7	84.9	88.1	189.90	88081	3542	S2-5
5/19/15 3:30 PM	1.657	29.2	85.7	87.6	181.77	87606	3475	S2-5
5/19/15 8:30 AM		22.2	90.7	96.4		96383	2434	S2-1R
5/19/15 9:30 AM		22.8	88.3	96.0		96002	2456	S2-1R
5/19/15 10:30 AM		24.2	83.2	94.8		94829	2505	S2-1R
5/19/15 11:30 AM		26.6	73.8	93.3		93282	2562	S2-1R
5/19/15 12:30 PM		28.1	68.3	91.3		91252	2604	S2-1R
5/19/15 1:30 PM		28.5	68.4	91.7		91655	2660	S2-1R
5/19/15 2:30 PM		30.9	59.5	89.8		89838	2656	S2-1R
5/19/15 3:30 PM		30.0	61.2	89.9		89898	2595	S2-1R
5/19/15 8:30 AM	2.224	22.1	100.0	96.4	122.92	96367	2671	S2-2
5/19/15 9:30 AM	1.700	22.7	100.0	95.7	216.83	95675	2768	S2-2
5/19/15 10:30 AM	1.624	24.2	100.0	94.5	212.83	94476	3020	S2-2
5/19/15 11:30 AM	1.790	26.6	96.1	92.1	213.15	92079	3341	S2-2
5/19/15 12:30 PM	2.159	28.0	92.7	89.3	219.82	89321	3501	S2-2
5/19/15 1:30 PM	2.009	28.4	91.9	89.5	218.32	89464	3558	S2-2
5/19/15 2:30 PM	1.678	29.7	84.9	88.1	227.21	88081	3542	S2-2
5/19/15 3:30 PM	1.531	29.2	85.7	87.6	216.55	87606	3475	S2-2

5/19/15 8:30 AM	2.257	22.1	100.0	96.4	190.03	96367	2671	S2-3
5/19/15 9:30 AM	1.200	22.7	100.0	95.7	210.26	95675	2768	S2-3
5/19/15 10:30 AM	1.158	24.2	100.0	94.5	226.56	94476	3020	S2-3
5/19/15 11:30 AM	1.120	26.6	96.1	92.1	205.54	92079	3341	S2-3
5/19/15 12:30 PM	2.150	28.0	92.7	89.3	234.64	89321	3501	S2-3
5/19/15 1:30 PM	1.886	28.4	91.9	89.5	227.78	89464	3558	S2-3
5/19/15 2:30 PM	1.830	29.7	84.9	88.1	232.07	88081	3542	S2-3
5/19/15 3:30 PM	1.664	29.2	85.7	87.6	213.88	87606	3475	S2-3
5/19/15 8:30 AM	2.579	22.1	100.0	96.4	198.42	96367	2671	S2-4
5/19/15 9:30 AM	1.559	22.7	100.0	95.7	211.61	95675	2768	S2-4
5/19/15 10:30 AM	1.403	24.2	100.0	94.5	233.52	94476	3020	S2-4
5/19/15 11:30 AM	1.448	26.6	96.1	92.1	204.73	92079	3341	S2-4
5/19/15 12:30 PM	2.632	28.0	92.7	89.3	235.77	89321	3501	S2-4
5/19/15 1:30 PM	2.078	28.4	91.9	89.5	224.38	89464	3558	S2-4
5/19/15 2:30 PM	2.235	29.7	84.9	88.1	228.92	88081	3542	S2-4
5/19/15 3:30 PM	2.227	29.2	85.7	87.6	218.54	87606	3475	S2-4
5/19/15 8:30 AM		21.8	100.0	95.9		95939	2607	S3
5/19/15 9:30 AM		22.5	98.6	95.3		95344	2690	S3
5/19/15 10:30 AM		24.1	87.1	93.5		93500	2610	S3
5/19/15 11:30 AM		26.9	74.0	92.2		92225	2620	S3
5/19/15 12:30 PM		28.3	66.5	90.2		90205	2561	S3
5/19/15 1:30 PM		28.8	66.1	90.4		90350	2618	S3
5/19/15 2:30 PM		31.5	58.4	88.4		88385	2712	S3
5/19/15 3:30 PM		30.5	59.2	88.7		88673	2588	S3
5/19/15 8:30 AM		22.2	98.4	96.5		96516	2628	S4
5/19/15 9:30 AM		22.7	97.4	95.7		95685	2687	S4
5/19/15 10:30 AM		24.1	86.9	94.7		94692	2608	S4
5/19/15 11:30 AM		27.0	72.4	92.6		92554	2566	S4
5/19/15 12:30 PM		28.2	69.2	91.0		90981	2642	S4
5/19/15 1:30 PM		28.5	67.9	91.3		91294	2650	S4
5/19/15 2:30 PM		30.4	61.5	90.0		89964	2667	S4
5/19/15 3:30 PM		29.6	62.4	90.1		90090	2581	S4
5/19/15 8:30 AM	1.349	21.3	88.6	95.5	192.51	95456	2242	S5-5
5/19/15 9:30 AM	0.837	22.2	84.4	94.4	186.79	94433	2264	S5-5
5/19/15 10:30 AM	0.831	24.3	77.2	92.9	187.41	92852	2339	S5-5
5/19/15 11:30 AM	0.780	28.0	67.5	90.0	184.11	89976	2552	S5-5
5/19/15 12:30 PM	1.136	28.8	64.6	87.2	184.24	87245	2562	S5-5
5/19/15 1:30 PM	1.102	29.3	63.8	87.3	185.94	87330	2603	S5-5
5/19/15 2:30 PM	0.782	30.7	61.9	85.8	174.49	85820	2734	S5-5
5/19/15 3:30 PM	0.709	30.5	61.7	85.2	174.48	85212	2701	S5-5
5/19/15 8:30 AM	1.964	21.3	88.6	95.5	170.81	95456	2242	S5-2
5/19/15 9:30 AM	1.253	22.2	84.4	94.4	191.77	94433	2264	S5-2
5/19/15 10:30 AM	1.268	24.3	77.2	92.9	193.24	92852	2339	S5-2
5/19/15 11:30 AM	1.221	28.0	67.5	90.0	186.40	89976	2552	S5-2
5/19/15 12:30 PM	1.740	28.8	64.6	87.2	212.50	87245	2562	S5-2
5/19/15 1:30 PM	1.584	29.3	63.8	87.3	197.13	87330	2603	S5-2
5/19/15 2:30 PM	1.353	30.7	61.9	85.8	225.58	85820	2734	S5-2
5/19/15 3:30 PM	1.474	30.5	61.7	85.2	206.93	85212	2701	S5-2
5/19/15 8:30 AM	2.290	21.3	88.6	95.5	166.05	95456	2242	S5-3
5/19/15 9:30 AM	1.587	22.2	84.4	94.4	185.55	94433	2264	S5-3
5/19/15 10:30 AM	1.419	24.3	77.2	92.9	199.63	92852	2339	S5-3
5/19/15 11:30 AM	1.482	28.0	67.5	90.0	191.79	89976	2552	S5-3
5/19/15 12:30 PM	2.301	28.8	64.6	87.2	204.18	87245	2562	S5-3
5/19/15 1:30 PM	1.922	29.3	63.8	87.3	196.25	87330	2603	S5-3
5/19/15 2:30 PM	1.790	30.7	61.9	85.8	232.40	85820	2734	S5-3

5/19/15 3:30 PM	2.264	30.5	61.7	85.2	215.88	85212	2701	S5-3
5/19/15 8:30 AM	2.591	21.3	88.6	95.5	168.99	95456	2242	S5-4
5/19/15 9:30 AM	1.784	22.2	84.4	94.4	186.98	94433	2264	S5-4
5/19/15 10:30 AM	1.565	24.3	77.2	92.9	215.90	92852	2339	S5-4
5/19/15 11:30 AM	1.598	28.0	67.5	90.0	194.71	89976	2552	S5-4
5/19/15 12:30 PM	2.649	28.8	64.6	87.2	206.48	87245	2562	S5-4
5/19/15 1:30 PM	2.152	29.3	63.8	87.3	195.02	87330	2603	S5-4
5/19/15 2:30 PM	2.313	30.7	61.9	85.8	227.49	85820	2734	S5-4
5/19/15 3:30 PM	2.802	30.5	61.7	85.2	213.46	85212	2701	S5-4
5/19/15 8:30 AM		21.2	98.5	95.7		95693	2485	S6
5/19/15 9:30 AM		21.8	93.6	94.9		94915	2449	S6
5/19/15 10:30 AM		23.5	87.5	93.3		93267	2530	S6
5/19/15 11:30 AM		26.2	77.5	91.0		91013	2639	S6
5/19/15 12:30 PM		27.4	71.7	89.6		89586	2619	S6
5/19/15 1:30 PM		28.4	67.1	89.3		89346	2606	S6
5/19/15 2:30 PM		28.5	65.6	88.9		88872	2559	S6
5/19/15 3:30 PM		28.1	65.7	90.1		90099	2504	S6
5/19/15 8:30 AM								S7
5/19/15 9:30 AM								S7
5/19/15 10:30 AM								S7
5/19/15 11:30 AM								S7
5/19/15 12:30 PM								S7
5/19/15 1:30 PM								S7
5/19/15 2:30 PM								S7
5/19/15 3:30 PM								S7

DE04

t	WS	T	RH	P	WD	p.air	p,wv	sample point
date	[m/s]	[C]	[%]	[KPa]	[deg]	[Pa]	[Pa]	
5/19/15 8:15 PM	0.589	23.9	82.4	94.2	172.57	94164	2441	S1-5
5/19/15 9:15 PM	1.185	23.3	84.5	95.3	167.77	95257	2427	S1-5
5/19/15 10:15 PM	1.085	23.3	86.5	95.3	160.46	95344	2481	S1-5
5/19/15 11:15 PM	1.409	23.0	87.1	95.4	162.44	95448	2454	S1-5
5/20/15 12:15 AM	1.650	22.8	87.3	95.8	163.24	95752	2424	S1-5
5/20/15 1:15 AM	1.376	22.7	87.4	95.8	163.62	95822	2415	S1-5
5/20/15 2:15 AM	1.516	21.7	84.9	96.2	175.18	96184	2214	S1-5
5/20/15 3:15 AM	1.874	19.7	78.3	97.4	169.71	97388	1796	S1-5
5/20/15 4:15 AM	1.973	18.1	76.9	98.5	186.06	98470	1600	S1-5
5/20/15 5:15 AM	1.853	17.1	77.9	99.3	186.08	99299	1521	S1-5
5/20/15 6:15 AM	2.223	16.7	78.5	99.7	186.18	99715	1496	S1-5
5/19/15 8:15 PM	0.705	23.9	82.4	94.2	42.88	94164	2441	S1-2
5/19/15 9:15 PM	1.608	23.3	84.5	95.3	41.67	95257	2427	S1-2
5/19/15 10:15 PM	0.268	23.3	86.5	95.3	41.82	95344	2481	S1-2
5/19/15 11:15 PM	0.268	23.0	87.1	95.4	41.58	95448	2454	S1-2
5/20/15 12:15 AM	0.268	22.8	87.3	95.8	40.94	95752	2424	S1-2
5/20/15 1:15 AM	0.268	22.7	87.4	95.8	40.79	95822	2415	S1-2
5/20/15 2:15 AM	0.533	21.7	84.9	96.2	41.32	96184	2214	S1-2
5/20/15 3:15 AM		19.7	78.3	97.4	41.25	97388	1796	S1-2
5/20/15 4:15 AM		18.1	76.9	98.5	41.26	98470	1600	S1-2
5/20/15 5:15 AM	1.852	17.1	77.9	99.3	42.33	99299	1521	S1-2
5/20/15 6:15 AM	2.164	16.7	78.5	99.7	41.43	99715	1496	S1-2
5/19/15 8:15 PM	0.906	23.9	82.4	94.2	201.18	94164	2441	S1-3
5/19/15 9:15 PM	1.694	23.3	84.5	95.3	204.57	95257	2427	S1-3
5/19/15 10:15 PM	1.707	23.3	86.5	95.3	206.64	95344	2481	S1-3
5/19/15 11:15 PM	1.595	23.0	87.1	95.4	211.62	95448	2454	S1-3
5/20/15 12:15 AM	2.233	22.8	87.3	95.8	217.39	95752	2424	S1-3
5/20/15 1:15 AM	1.845	22.7	87.4	95.8	240.97	95822	2415	S1-3

5/20/15 2:15 AM	2.851	21.7	84.9	96.2	244.79	96184	2214	S1-3
5/20/15 3:15 AM	3.707	19.7	78.3	97.4	239.27	97388	1796	S1-3
5/20/15 4:15 AM	3.484	18.1	76.9	98.5	235.06	98470	1600	S1-3
5/20/15 5:15 AM	3.280	17.1	77.9	99.3	240.45	99299	1521	S1-3
5/20/15 6:15 AM	3.694	16.7	78.5	99.7	238.53	99715	1496	S1-3
5/19/15 8:15 PM	0.268	23.9	82.4	94.2	180.30	94164	2441	S1-4
5/19/15 9:15 PM	0.268	23.3	84.5	95.3	180.29	95257	2427	S1-4
5/19/15 10:15 PM	0.268	23.3	86.5	95.3	180.30	95344	2481	S1-4
5/19/15 11:15 PM	0.268	23.0	87.1	95.4	180.30	95448	2454	S1-4
5/20/15 12:15 AM	0.268	22.8	87.3	95.8	180.30	95752	2424	S1-4
5/20/15 1:15 AM	0.268	22.7	87.4	95.8	180.30	95822	2415	S1-4
5/20/15 2:15 AM	0.268	21.7	84.9	96.2	180.30	96184	2214	S1-4
5/20/15 3:15 AM	0.268	19.7	78.3	97.4	180.30	97388	1796	S1-4
5/20/15 4:15 AM	0.268	18.1	76.9	98.5	180.30	98470	1600	S1-4
5/20/15 5:15 AM	0.268	17.1	77.9	99.3	180.30	99299	1521	S1-4
5/20/15 6:15 AM	0.268	16.7	78.5	99.7	180.30	99715	1496	S1-4
5/19/15 8:15 PM	2.366	24.6	100.0	94.4	133.07	94363	3088	S2-5
5/19/15 9:15 PM	1.778	23.7	100.0	95.5	150.31	95484	2924	S2-5
5/19/15 10:15 PM	2.272	23.3	100.0	95.5	147.58	95544	2863	S2-5
5/19/15 11:15 PM	1.788	22.8	100.0	95.7	173.05	95676	2770	S2-5
5/20/15 12:15 AM	1.453	22.3	100.0	95.8	193.21	95769	2687	S2-5
5/20/15 1:15 AM	1.760	22.0	100.0	96.0	183.56	95964	2640	S2-5
5/20/15 2:15 AM	2.149	20.8	100.0	96.8	206.55	96840	2457	S2-5
5/20/15 3:15 AM	1.645	19.4	94.2	98.2	234.26	98161	2121	S2-5
5/20/15 4:15 AM	1.964	17.9	93.1	99.1	200.37	99060	1912	S2-5
5/20/15 5:15 AM	2.074	16.7	96.8	100.0	195.22	100028	1839	S2-5
5/20/15 6:15 AM	2.276	16.8	96.1	100.5	173.96	100521	1838	S2-5
5/19/15 8:15 PM		24.7	78.5	95.4		95389	2445	S2-1
5/19/15 9:15 PM		23.7	84.5	95.7		95732	2479	S2-1
5/19/15 10:15 PM		23.4	89.7	95.6		95605	2586	S2-1
5/19/15 11:15 PM		22.8	90.9	95.9		95949	2519	S2-1
5/20/15 12:15 AM		22.2	92.1	96.1		96061	2465	S2-1
5/20/15 1:15 AM		21.9	94.7	96.2		96180	2498	S2-1
5/20/15 2:15 AM		20.9	88.2	97.1		97131	2184	S2-1
5/20/15 3:15 AM		19.4	69.9	98.6		98588	1580	S2-1
5/20/15 4:15 AM		18.0	68.9	99.5		99455	1423	S2-1
5/20/15 5:15 AM		16.8	72.1	100.4		100372	1375	S2-1
5/20/15 6:15 AM		16.8	71.5	100.4		100426	1372	S2-1
5/19/15 8:15 PM	1.619	24.6	100.0	94.4	209.29	94363	3088	S2-2
5/19/15 9:15 PM	1.919	23.7	100.0	95.5	215.23	95484	2924	S2-2
5/19/15 10:15 PM	1.951	23.3	100.0	95.5	223.49	95544	2863	S2-2
5/19/15 11:15 PM	1.822	22.8	100.0	95.7	225.53	95676	2770	S2-2
5/20/15 12:15 AM	1.617	22.3	100.0	95.8	220.77	95769	2687	S2-2
5/20/15 1:15 AM	1.108	22.0	100.0	96.0	208.93	95964	2640	S2-2
5/20/15 2:15 AM	1.782	20.8	100.0	96.8	222.05	96840	2457	S2-2
5/20/15 3:15 AM	2.378	19.4	94.2	98.2	221.96	98161	2121	S2-2
5/20/15 4:15 AM	2.588	17.9	93.1	99.1	218.31	99060	1912	S2-2
5/20/15 5:15 AM	2.537	16.7	96.8	100.0	221.28	100028	1839	S2-2
5/20/15 6:15 AM	2.693	16.8	96.1	100.5	226.90	100521	1838	S2-2
5/19/15 8:15 PM	0.846	24.6	100.0	94.4	185.50	94363	3088	S2-3
5/19/15 9:15 PM	1.555	23.7	100.0	95.5	180.79	95484	2924	S2-3
5/19/15 10:15 PM	1.377	23.3	100.0	95.5	187.40	95544	2863	S2-3
5/19/15 11:15 PM	1.641	22.8	100.0	95.7	191.33	95676	2770	S2-3
5/20/15 12:15 AM	1.860	22.3	100.0	95.8	213.40	95769	2687	S2-3
5/20/15 1:15 AM	1.191	22.0	100.0	96.0	225.08	95964	2640	S2-3
5/20/15 2:15 AM	2.260	20.8	100.0	96.8	245.97	96840	2457	S2-3
5/20/15 3:15 AM	3.222	19.4	94.2	98.2	245.23	98161	2121	S2-3

5/20/15 4:15 AM	3.306	17.9	93.1	99.1	235.98	99060	1912	S2-3
5/20/15 5:15 AM	3.184	16.7	96.8	100.0	243.41	100028	1839	S2-3
5/20/15 6:15 AM	3.443	16.8	96.1	100.5	212.54	100521	1838	S2-3
5/19/15 8:15 PM	1.100	24.6	100.0	94.4	186.90	94363	3088	S2-4
5/19/15 9:15 PM	2.243	23.7	100.0	95.5	191.21	95484	2924	S2-4
5/19/15 10:15 PM	1.829	23.3	100.0	95.5	190.76	95544	2863	S2-4
5/19/15 11:15 PM	2.080	22.8	100.0	95.7	195.79	95676	2770	S2-4
5/20/15 12:15 AM	2.351	22.3	100.0	95.8	207.79	95769	2687	S2-4
5/20/15 1:15 AM	1.890	22.0	100.0	96.0	230.75	95964	2640	S2-4
5/20/15 2:15 AM	3.034	20.8	100.0	96.8	243.24	96840	2457	S2-4
5/20/15 3:15 AM	3.983	19.4	94.2	98.2	242.97	98161	2121	S2-4
5/20/15 4:15 AM	3.960	17.9	93.1	99.1	247.86	99060	1912	S2-4
5/20/15 5:15 AM	3.739	16.7	96.8	100.0	242.92	100028	1839	S2-4
5/20/15 6:15 AM	4.123	16.8	96.1	100.5	235.83	100521	1838	S2-4
5/19/15 8:15 PM		24.3	85.8	95.2		95218	2597	S3
5/19/15 9:15 PM		23.4	94.4	95.5		95452	2712	S3
5/19/15 10:15 PM		23.0	99.9	95.3		95261	2808	S3
5/19/15 11:15 PM		22.4	100.0	95.5		95539	2713	S3
5/20/15 12:15 AM		21.8	100.0	95.6		95644	2617	S3
5/20/15 1:15 AM		21.0	100.0	95.8		95764	2493	S3
5/20/15 2:15 AM		19.9	95.4	96.3		96280	2220	S3
5/20/15 3:15 AM		19.1	73.7	98.0		97968	1629	S3
5/20/15 4:15 AM		17.9	68.2	99.1		99099	1397	S3
5/20/15 5:15 AM		16.6	71.0	100.2		100202	1340	S3
5/20/15 6:15 AM		16.5	70.4	100.3		100290	1319	S3
5/19/15 8:15 PM		24.8	77.3	95.6		95597	2426	S4
5/19/15 9:15 PM		23.6	88.8	95.7		95737	2589	S4
5/19/15 10:15 PM		23.3	98.9	95.4		95393	2829	S4
5/19/15 11:15 PM		22.7	99.8	95.7		95664	2752	S4
5/20/15 12:15 AM		22.2	100.0	96.0		96007	2684	S4
5/20/15 1:15 AM		22.2	100.0	96.3		96284	2672	S4
5/20/15 2:15 AM		21.2	93.9	97.0		97046	2371	S4
5/20/15 3:15 AM		19.5	72.6	98.7		98746	1652	S4
5/20/15 4:15 AM		18.2	72.7	99.6		99591	1517	S4
5/20/15 5:15 AM		17.0	75.4	100.4		100356	1464	S4
5/20/15 6:15 AM		17.0	74.7	100.4		100421	1451	S4
5/19/15 8:15 PM	1.204	23.9	76.6	92.1	193.60	92057	2271	S5-5
5/19/15 9:15 PM	1.078	22.5	82.7	94.2	134.45	94216	2251	S5-5
5/19/15 10:15 PM	0.497	22.1	87.2	94.5	137.87	94496	2325	S5-5
5/19/15 11:15 PM	0.771	21.5	89.0	94.5	140.04	94537	2291	S5-5
5/20/15 12:15 AM	0.685	21.2	89.1	94.8	156.62	94767	2244	S5-5
5/20/15 1:15 AM	0.273	20.2	90.4	95.0	168.09	95009	2145	S5-5
5/20/15 2:15 AM	1.234	19.3	87.4	95.6	178.91	95571	1960	S5-5
5/20/15 3:15 AM	1.760	18.6	71.7	97.1	177.65	97113	1538	S5-5
5/20/15 4:15 AM	1.070	17.0	68.7	98.2	183.24	98167	1334	S5-5
5/20/15 5:15 AM	1.007	15.8	70.4	99.0	183.82	98980	1265	S5-5
5/20/15 6:15 AM	1.342	16.6	67.2	99.4	186.26	99398	1266	S5-5
5/19/15 8:15 PM	1.225	23.9	76.6	92.1	138.39	92057	2271	S5-2
5/19/15 9:15 PM	1.890	22.5	82.7	94.2	198.76	94216	2251	S5-2
5/19/15 10:15 PM	1.348	22.1	87.2	94.5	203.37	94496	2325	S5-2
5/19/15 11:15 PM	1.577	21.5	89.0	94.5	215.04	94537	2291	S5-2
5/20/15 12:15 AM	1.419	21.2	89.1	94.8	217.02	94767	2244	S5-2
5/20/15 1:15 AM	0.463	20.2	90.4	95.0	238.15	95009	2145	S5-2
5/20/15 2:15 AM	1.698	19.3	87.4	95.6	264.95	95571	1960	S5-2
5/20/15 3:15 AM	2.443	18.6	71.7	97.1	244.31	97113	1538	S5-2
5/20/15 4:15 AM	2.056	17.0	68.7	98.2	216.94	98167	1334	S5-2
5/20/15 5:15 AM	2.040	15.8	70.4	99.0	213.67	98980	1265	S5-2

5/20/15 6:15 AM	2.286	16.6	67.2	99.4	192.98	99398	1266	S5-2
5/19/15 8:15 PM	0.762	23.9	76.6	92.1	164.74	92057	2271	S5-3
5/19/15 9:15 PM	2.257	22.5	82.7	94.2	203.44	94216	2251	S5-3
5/19/15 10:15 PM	1.735	22.1	87.2	94.5	204.15	94496	2325	S5-3
5/19/15 11:15 PM	1.999	21.5	89.0	94.5	209.94	94537	2291	S5-3
5/20/15 12:15 AM	1.941	21.2	89.1	94.8	222.40	94767	2244	S5-3
5/20/15 1:15 AM	1.446	20.2	90.4	95.0	236.86	95009	2145	S5-3
5/20/15 2:15 AM	2.640	19.3	87.4	95.6	244.12	95571	1960	S5-3
5/20/15 3:15 AM	3.596	18.6	71.7	97.1	243.53	97113	1538	S5-3
5/20/15 4:15 AM	2.829	17.0	68.7	98.2	189.55	98167	1334	S5-3
5/20/15 5:15 AM	2.803	15.8	70.4	99.0	186.96	98980	1265	S5-3
5/20/15 6:15 AM	3.088	16.6	67.2	99.4	173.23	99398	1266	S5-3
5/19/15 8:15 PM	0.994	23.9	76.6	92.1	186.79	92057	2271	S5-4
5/19/15 9:15 PM	2.633	22.5	82.7	94.2	196.75	94216	2251	S5-4
5/19/15 10:15 PM	2.045	22.1	87.2	94.5	201.88	94496	2325	S5-4
5/19/15 11:15 PM	2.269	21.5	89.0	94.5	202.80	94537	2291	S5-4
5/20/15 12:15 AM	2.234	21.2	89.1	94.8	217.58	94767	2244	S5-4
5/20/15 1:15 AM	1.990	20.2	90.4	95.0	231.69	95009	2145	S5-4
5/20/15 2:15 AM	3.123	19.3	87.4	95.6	247.96	95571	1960	S5-4
5/20/15 3:15 AM	4.168	18.6	71.7	97.1	243.97	97113	1538	S5-4
5/20/15 4:15 AM	3.647	17.0	68.7	98.2	212.80	98167	1334	S5-4
5/20/15 5:15 AM	3.562	15.8	70.4	99.0	211.58	98980	1265	S5-4
5/20/15 6:15 AM	3.872	16.6	67.2	99.4	180.67	99398	1266	S5-4
5/19/15 8:15 PM		24.1	78.2	94.2		94152	2345	S6
5/19/15 9:15 PM		22.9	83.0	94.9		94866	2314	S6
5/19/15 10:15 PM		22.4	88.3	94.7		94701	2398	S6
5/19/15 11:15 PM		21.9	90.6	94.8		94834	2386	S6
5/20/15 12:15 AM		21.7	90.5	95.1		95054	2348	S6
5/20/15 1:15 AM		21.1	92.4	95.5		95516	2309	S6
5/20/15 2:15 AM		19.9	90.3	96.2		96155	2101	S6
5/20/15 3:15 AM		19.4	73.1	97.5		97506	1645	S6
5/20/15 4:15 AM		17.5	71.6	98.7		98665	1431	S6
5/20/15 5:15 AM		16.4	72.2	99.3		99280	1347	S6
5/20/15 6:15 AM		17.3	68.1	99.0		98954	1346	S6
5/19/15 8:15 PM								S7
5/19/15 9:15 PM								S7
5/19/15 10:15 PM								S7
5/19/15 11:15 PM								S7
5/20/15 12:15 AM								S7
5/20/15 1:15 AM								S7
5/20/15 2:15 AM								S7
5/20/15 3:15 AM								S7
5/20/15 4:15 AM								S7
5/20/15 5:15 AM								S7
5/20/15 6:15 AM								S7

DE05

t	WS	T	RH	P	WD	p.air	p,wv	sample point	
date	[m/s]	[C]	[%]	[KPa]	[deg]	[Pa]	[Pa]		
5/20/15	7:50 AM	2.738	16.7	74.1	100.1	178.87	100057	1406	S1-5
5/20/15	8:50 AM	2.935	18.2	66.8	99.2	171.45	99162	1392	S1-5
5/20/15	9:50 AM	3.013	19.3	63.3	98.4	173.16	98368	1420	S1-5
5/20/15	10:50 AM	2.962	20.2	61.9	97.4	177.22	97361	1463	S1-5
5/20/15	11:50 AM	2.918	20.6	62.9	96.2	174.15	96244	1524	S1-5
5/20/15	12:50 PM	2.883	21.3	62.0	95.5	174.01	95488	1572	S1-5
5/20/15	1:50 PM	3.249	21.7	60.8	95.1	167.54	95101	1581	S1-5
5/20/15	2:50 PM	2.966	21.7	61.4	95.0	171.20	94985	1594	S1-5
5/20/15	3:50 PM	2.967	21.2	63.3	95.3	170.27	95256	1590	S1-5

5/20/15 4:50 PM	2.671	19.8	65.0	96.4	173.25	96426	1505	S1-5
5/20/15 5:50 PM	2.395	19.0	65.6	97.0	174.68	96994	1439	S1-5
5/20/15 6:50 PM	2.177	17.7	67.6	98.1	183.84	98140	1370	S1-5
5/20/15 7:50 AM	4.777	16.7	74.1	100.1	43.42	100057	1406	S1-2
5/20/15 8:50 AM		18.2	66.8	99.2	41.66	99162	1392	S1-2
5/20/15 9:50 AM	0.268	19.3	63.3	98.4	41.64	98368	1420	S1-2
5/20/15 10:50 AM	0.268	20.2	61.9	97.4	40.82	97361	1463	S1-2
5/20/15 11:50 AM	0.268	20.6	62.9	96.2	41.39	96244	1524	S1-2
5/20/15 12:50 PM	0.268	21.3	62.0	95.5	40.78	95488	1572	S1-2
5/20/15 1:50 PM	0.268	21.7	60.8	95.1	41.08	95101	1581	S1-2
5/20/15 2:50 PM	0.268	21.7	61.4	95.0	40.66	94985	1594	S1-2
5/20/15 3:50 PM	0.268	21.2	63.3	95.3	40.91	95256	1590	S1-2
5/20/15 4:50 PM	0.268	19.8	65.0	96.4	41.11	96426	1505	S1-2
5/20/15 5:50 PM	0.268	19.0	65.6	97.0	40.71	96994	1439	S1-2
5/20/15 6:50 PM	0.268	17.7	67.6	98.1	41.24	98140	1370	S1-2
5/20/15 7:50 AM	5.343	16.7	74.1	100.1	247.96	100057	1406	S1-3
5/20/15 8:50 AM	6.207	18.2	66.8	99.2	247.25	99162	1392	S1-3
5/20/15 9:50 AM	6.133	19.3	63.3	98.4	245.74	98368	1420	S1-3
5/20/15 10:50 AM	5.718	20.2	61.9	97.4	231.89	97361	1463	S1-3
5/20/15 11:50 AM	5.830	20.6	62.9	96.2	247.31	96244	1524	S1-3
5/20/15 12:50 PM	5.295	21.3	62.0	95.5	236.29	95488	1572	S1-3
5/20/15 1:50 PM	5.744	21.7	60.8	95.1	245.78	95101	1581	S1-3
5/20/15 2:50 PM	5.120	21.7	61.4	95.0	242.15	94985	1594	S1-3
5/20/15 3:50 PM	5.683	21.2	63.3	95.3	244.17	95256	1590	S1-3
5/20/15 4:50 PM	5.166	19.8	65.0	96.4	245.71	96426	1505	S1-3
5/20/15 5:50 PM	4.622	19.0	65.6	97.0	247.06	96994	1439	S1-3
5/20/15 6:50 PM	4.299	17.7	67.6	98.1	241.23	98140	1370	S1-3
5/20/15 7:50 AM	0.268	16.7	74.1	100.1	180.30	100057	1406	S1-4
5/20/15 8:50 AM	0.268	18.2	66.8	99.2	180.30	99162	1392	S1-4
5/20/15 9:50 AM	0.268	19.3	63.3	98.4	180.30	98368	1420	S1-4
5/20/15 10:50 AM	0.268	20.2	61.9	97.4	180.30	97361	1463	S1-4
5/20/15 11:50 AM	0.268	20.6	62.9	96.2	180.30	96244	1524	S1-4
5/20/15 12:50 PM	0.268	21.3	62.0	95.5	180.29	95488	1572	S1-4
5/20/15 1:50 PM	0.268	21.7	60.8	95.1	180.30	95101	1581	S1-4
5/20/15 2:50 PM	0.268	21.7	61.4	95.0	180.30	94985	1594	S1-4
5/20/15 3:50 PM	0.268	21.2	63.3	95.3	180.30	95256	1590	S1-4
5/20/15 4:50 PM	0.268	19.8	65.0	96.4	180.30	96426	1505	S1-4
5/20/15 5:50 PM	0.268	19.0	65.6	97.0	180.29	96994	1439	S1-4
5/20/15 6:50 PM	0.268	17.7	67.6	98.1	180.30	98140	1370	S1-4
5/20/15 7:50 AM	3.520	19.3	74.4	99.0	228.05	98980	1666	S2-5
5/20/15 8:50 AM	3.903	20.9	66.3	97.3	236.28	97347	1640	S2-5
5/20/15 9:50 AM	3.708	22.4	61.7	95.8	238.16	95754	1667	S2-5
5/20/15 10:50 AM	3.627	22.8	61.8	94.8	226.69	94774	1716	S2-5
5/20/15 11:50 AM	3.554	22.8	61.9	93.8	235.02	93794	1721	S2-5
5/20/15 12:50 PM	3.082	23.6	61.2	93.1	225.04	93061	1784	S2-5
5/20/15 1:50 PM	2.840	23.8	59.2	92.2	239.39	92208	1744	S2-5
5/20/15 2:50 PM	2.733	24.1	59.3	91.9	228.81	91894	1782	S2-5
5/20/15 3:50 PM	3.222	23.3	59.9	92.6	226.97	92585	1712	S2-5
5/20/15 4:50 PM	2.863	22.8	59.4	94.6	230.74	94594	1652	S2-5
5/20/15 5:50 PM	2.805	21.8	61.1	96.1	221.38	96099	1599	S2-5
5/20/15 6:50 PM	2.806	19.2	68.4	98.0	213.11	98019	1518	S2-5
5/20/15 7:50 AM		18.7	58.4	98.5		98459	1258	S2-1R
5/20/15 8:50 AM		20.1	52.6	97.7		97651	1242	S2-1R
5/20/15 9:50 AM		20.9	50.2	96.8		96755	1244	S2-1R
5/20/15 10:50 AM		20.8	51.6	96.5		96510	1265	S2-1R
5/20/15 11:50 AM		22.0	49.2	96.3		96311	1305	S2-1R
5/20/15 12:50 PM		23.8	48.6	96.2		96178	1438	S2-1R

5/20/15 1:50 PM		24.4	46.7	95.5		95503	1425	S2-1R
5/20/15 2:50 PM		25.5	43.9	94.2		94225	1429	S2-1R
5/20/15 3:50 PM		24.4	45.3	94.5		94481	1379	S2-1R
5/20/15 4:50 PM		23.2	47.1	95.7		95737	1343	S2-1R
5/20/15 5:50 PM		22.1	48.0	96.5		96520	1275	S2-1R
5/20/15 6:50 PM		19.1	51.9	98.9		98884	1144	S2-1R
5/20/15 7:50 AM	4.567	19.3	74.4	99.0	221.79	98980	1666	S2-2
5/20/15 8:50 AM	4.870	20.9	66.3	97.3	222.42	97347	1640	S2-2
5/20/15 9:50 AM	4.608	22.4	61.7	95.8	225.56	95754	1667	S2-2
5/20/15 10:50 AM	4.454	22.8	61.8	94.8	223.08	94774	1716	S2-2
5/20/15 11:50 AM	4.387	22.8	61.9	93.8	220.25	93794	1721	S2-2
5/20/15 12:50 PM	3.712	23.6	61.2	93.1	223.06	93061	1784	S2-2
5/20/15 1:50 PM	3.505	23.8	59.2	92.2	217.64	92208	1744	S2-2
5/20/15 2:50 PM	3.399	24.1	59.3	91.9	219.29	91894	1782	S2-2
5/20/15 3:50 PM	4.031	23.3	59.9	92.6	220.62	92585	1712	S2-2
5/20/15 4:50 PM	3.647	22.8	59.4	94.6	221.62	94594	1652	S2-2
5/20/15 5:50 PM	3.445	21.8	61.1	96.1	222.39	96099	1599	S2-2
5/20/15 6:50 PM	3.401	19.2	68.4	98.0	223.19	98019	1518	S2-2
5/20/15 7:50 AM	5.543	19.3	74.4	99.0	233.41	98980	1666	S2-3
5/20/15 8:50 AM	6.027	20.9	66.3	97.3	241.61	97347	1640	S2-3
5/20/15 9:50 AM	5.837	22.4	61.7	95.8	241.81	95754	1667	S2-3
5/20/15 10:50 AM	5.527	22.8	61.8	94.8	227.11	94774	1716	S2-3
5/20/15 11:50 AM	5.470	22.8	61.9	93.8	246.83	93794	1721	S2-3
5/20/15 12:50 PM	4.672	23.6	61.2	93.1	239.69	93061	1784	S2-3
5/20/15 1:50 PM	4.613	23.8	59.2	92.2	243.24	92208	1744	S2-3
5/20/15 2:50 PM	4.338	24.1	59.3	91.9	238.02	91894	1782	S2-3
5/20/15 3:50 PM	5.153	23.3	59.9	92.6	245.35	92585	1712	S2-3
5/20/15 4:50 PM	4.615	22.8	59.4	94.6	240.49	94594	1652	S2-3
5/20/15 5:50 PM	4.331	21.8	61.1	96.1	244.28	96099	1599	S2-3
5/20/15 6:50 PM	4.239	19.2	68.4	98.0	239.48	98019	1518	S2-3
5/20/15 7:50 AM	6.167	19.3	74.4	99.0	247.20	98980	1666	S2-4
5/20/15 8:50 AM	6.827	20.9	66.3	97.3	248.16	97347	1640	S2-4
5/20/15 9:50 AM	6.713	22.4	61.7	95.8	240.41	95754	1667	S2-4
5/20/15 10:50 AM	6.218	22.8	61.8	94.8	237.24	94774	1716	S2-4
5/20/15 11:50 AM	6.322	22.8	61.9	93.8	235.32	93794	1721	S2-4
5/20/15 12:50 PM	5.546	23.6	61.2	93.1	238.79	93061	1784	S2-4
5/20/15 1:50 PM	5.839	23.8	59.2	92.2	241.50	92208	1744	S2-4
5/20/15 2:50 PM	5.301	24.1	59.3	91.9	232.54	91894	1782	S2-4
5/20/15 3:50 PM	6.061	23.3	59.9	92.6	237.39	92585	1712	S2-4
5/20/15 4:50 PM	5.414	22.8	59.4	94.6	250.24	94594	1652	S2-4
5/20/15 5:50 PM	4.980	21.8	61.1	96.1	238.95	96099	1599	S2-4
5/20/15 6:50 PM	4.783	19.2	68.4	98.0	242.60	98019	1518	S2-4
5/20/15 7:50 AM		17.9	60.9	98.5		98464	1250	S3
5/20/15 8:50 AM		19.7	67.5	97.0		97038	1549	S3
5/20/15 9:50 AM		21.0	62.7	96.7		96666	1559	S3
5/20/15 10:50 AM		21.8	58.0	97.1		97078	1514	S3
5/20/15 11:50 AM		23.1	49.9	95.4		95425	1405	S3
5/20/15 12:50 PM		24.3	47.8	94.6		94572	1450	S3
5/20/15 1:50 PM		25.2	47.1	93.7		93724	1510	S3
5/20/15 2:50 PM		25.5	47.2	93.5		93518	1540	S3
5/20/15 3:50 PM		24.5	47.1	93.9		93920	1450	S3
5/20/15 4:50 PM		23.2	46.6	95.3		95302	1330	S3
5/20/15 5:50 PM		21.7	48.8	96.1		96130	1266	S3
5/20/15 6:50 PM		19.3	57.2	98.4		98372	1272	S3
5/20/15 7:50 AM		18.2	61.2	98.8		98781	1277	S4
5/20/15 8:50 AM		19.4	62.9	97.7		97700	1419	S4
5/20/15 9:50 AM		20.8	57.1	96.7		96728	1399	S4

5/20/15 10:50 AM		21.7	55.1	96.1		96132	1433	S4
5/20/15 11:50 AM		22.4	51.4	95.7		95672	1390	S4
5/20/15 12:50 PM		23.4	49.3	95.2		95179	1421	S4
5/20/15 1:50 PM		24.1	46.5	94.6		94632	1395	S4
5/20/15 2:50 PM		24.5	46.9	94.4		94423	1442	S4
5/20/15 3:50 PM		23.4	47.6	94.9		94882	1369	S4
5/20/15 4:50 PM		22.4	47.8	96.4		96406	1298	S4
5/20/15 5:50 PM		21.2	52.8	97.2		97249	1332	S4
5/20/15 6:50 PM		18.9	60.2	99.0		98966	1319	S4
5/20/15 7:50 AM	3.065	18.4	62.2	97.5	181.84	97475	1318	S5-5
5/20/15 8:50 AM	3.364	19.9	54.1	96.0	180.53	96026	1254	S5-5
5/20/15 9:50 AM	2.998	21.3	50.3	94.4	178.69	94413	1272	S5-5
5/20/15 10:50 AM	2.922	22.0	50.4	93.6	182.71	93560	1332	S5-5
5/20/15 11:50 AM	2.988	22.5	50.0	92.5	178.53	92524	1360	S5-5
5/20/15 12:50 PM	2.405	22.7	50.0	91.8	180.95	91825	1381	S5-5
5/20/15 1:50 PM	2.214	22.8	49.9	91.0	172.40	90973	1389	S5-5
5/20/15 2:50 PM	2.135	23.0	49.7	90.6	177.85	90586	1397	S5-5
5/20/15 3:50 PM	2.961	22.1	49.9	91.5	178.23	91549	1333	S5-5
5/20/15 4:50 PM	2.584	21.7	50.1	93.9	175.75	93920	1299	S5-5
5/20/15 5:50 PM	2.186	20.8	50.6	95.0	180.58	95026	1248	S5-5
5/20/15 6:50 PM	1.740	18.4	52.3	96.9	183.24	96913	1105	S5-5
5/20/15 7:50 AM	4.423	18.4	62.2	97.5	231.51	97475	1318	S5-2
5/20/15 8:50 AM	4.571	19.9	54.1	96.0	237.91	96026	1254	S5-2
5/20/15 9:50 AM	4.155	21.3	50.3	94.4	232.88	94413	1272	S5-2
5/20/15 10:50 AM	4.137	22.0	50.4	93.6	220.85	93560	1332	S5-2
5/20/15 11:50 AM	4.001	22.5	50.0	92.5	238.73	92524	1360	S5-2
5/20/15 12:50 PM	3.337	22.7	50.0	91.8	228.15	91825	1381	S5-2
5/20/15 1:50 PM	3.091	22.8	49.9	91.0	238.29	90973	1389	S5-2
5/20/15 2:50 PM	2.860	23.0	49.7	90.6	223.28	90586	1397	S5-2
5/20/15 3:50 PM	3.704	22.1	49.9	91.5	230.05	91549	1333	S5-2
5/20/15 4:50 PM	3.311	21.7	50.1	93.9	236.10	93920	1299	S5-2
5/20/15 5:50 PM	3.175	20.8	50.6	95.0	226.64	95026	1248	S5-2
5/20/15 6:50 PM	2.987	18.4	52.3	96.9	211.41	96913	1105	S5-2
5/20/15 7:50 AM	5.478	18.4	62.2	97.5	213.21	97475	1318	S5-3
5/20/15 8:50 AM	6.015	19.9	54.1	96.0	234.77	96026	1254	S5-3
5/20/15 9:50 AM	5.802	21.3	50.3	94.4	227.53	94413	1272	S5-3
5/20/15 10:50 AM	5.314	22.0	50.4	93.6	208.99	93560	1332	S5-3
5/20/15 11:50 AM	5.487	22.5	50.0	92.5	233.59	92524	1360	S5-3
5/20/15 12:50 PM	4.733	22.7	50.0	91.8	226.07	91825	1381	S5-3
5/20/15 1:50 PM	5.039	22.8	49.9	91.0	246.78	90973	1389	S5-3
5/20/15 2:50 PM	4.477	23.0	49.7	90.6	234.87	90586	1397	S5-3
5/20/15 3:50 PM	5.290	22.1	49.9	91.5	228.37	91549	1333	S5-3
5/20/15 4:50 PM	4.666	21.7	50.1	93.9	237.53	93920	1299	S5-3
5/20/15 5:50 PM	4.352	20.8	50.6	95.0	225.05	95026	1248	S5-3
5/20/15 6:50 PM	3.800	18.4	52.3	96.9	202.47	96913	1105	S5-3
5/20/15 7:50 AM	6.169	18.4	62.2	97.5	228.67	97475	1318	S5-4
5/20/15 8:50 AM	6.836	19.9	54.1	96.0	236.90	96026	1254	S5-4
5/20/15 9:50 AM	6.785	21.3	50.3	94.4	236.97	94413	1272	S5-4
5/20/15 10:50 AM	6.149	22.0	50.4	93.6	212.78	93560	1332	S5-4
5/20/15 11:50 AM	6.298	22.5	50.0	92.5	231.80	92524	1360	S5-4
5/20/15 12:50 PM	5.565	22.7	50.0	91.8	232.31	91825	1381	S5-4
5/20/15 1:50 PM	6.012	22.8	49.9	91.0	246.91	90973	1389	S5-4
5/20/15 2:50 PM	5.343	23.0	49.7	90.6	238.75	90586	1397	S5-4
5/20/15 3:50 PM	6.131	22.1	49.9	91.5	230.85	91549	1333	S5-4
5/20/15 4:50 PM	5.496	21.7	50.1	93.9	228.27	93920	1299	S5-4
5/20/15 5:50 PM	5.093	20.8	50.6	95.0	234.51	95026	1248	S5-4
5/20/15 6:50 PM	4.537	18.4	52.3	96.9	208.53	96913	1105	S5-4

5/20/15 7:50 AM			20.3	56.4	95.9		95899	1341	S6
5/20/15 8:50 AM			21.5	51.0	95.3		95336	1309	S6
5/20/15 9:50 AM			22.0	48.0	95.4		95448	1267	S6
5/20/15 10:50 AM			22.6	48.9	95.6		95598	1341	S6
5/20/15 11:50 AM			23.7	46.3	95.4		95411	1357	S6
5/20/15 12:50 PM			23.9	46.1	94.8		94838	1370	S6
5/20/15 1:50 PM			22.6	47.3	94.9		94912	1302	S6
5/20/15 2:50 PM			21.5	52.7	96.1		96140	1353	S6
5/20/15 3:50 PM			21.2	51.7	97.2		97155	1303	S6
5/20/15 4:50 PM			20.5	51.8	97.9		97933	1252	S6
5/20/15 5:50 PM			19.8	52.8	98.5		98542	1220	S6
5/20/15 6:50 PM			18.6	55.5	98.9		98927	1188	S6
5/20/15 7:50 AM									S7
5/20/15 8:50 AM									S7
5/20/15 9:50 AM									S7
5/20/15 10:50 AM									S7
5/20/15 11:50 AM									S7
5/20/15 12:50 PM									S7
5/20/15 1:50 PM									S7
5/20/15 2:50 PM									S7
5/20/15 3:50 PM									S7
5/20/15 4:50 PM									S7
5/20/15 5:50 PM									S7
5/20/15 6:50 PM									S7
DE06									
t	WS	T	RH	P	WD	p.air	p,wv	sample point	
date	[m/s]	[C]	[%]	[KPa]	[deg]	[Pa]	[Pa]		
5/20/15 8:15 PM		1.773	15.7	70.7	100.1	189.30	100079	1259	S1-5
5/20/15 9:15 PM		1.357	14.4	72.9	101.3	188.03	101292	1198	S1-5
5/20/15 10:15 PM		1.082	13.9	73.6	101.8	191.00	101843	1172	S1-5
5/20/15 11:15 PM		1.079	13.4	74.0	102.2	192.38	102161	1137	S1-5
5/21/15 12:15 AM		0.968	12.7	73.0	102.5	196.28	102539	1071	S1-5
5/21/15 1:15 AM		0.981	12.0	73.7	102.9	196.32	102858	1037	S1-5
5/21/15 2:15 AM		0.968	11.7	74.6	103.1	192.99	103113	1027	S1-5
5/21/15 3:15 AM		0.768	12.0	75.0	103.1	196.57	103108	1049	S1-5
5/21/15 4:15 AM		1.481	12.1	75.8	103.0	200.67	102971	1071	S1-5
5/21/15 5:15 AM		1.671	12.5	75.5	102.7	205.65	102735	1095	S1-5
5/21/15 6:15 AM		1.479	12.5	75.8	102.6	205.49	102607	1102	S1-5
5/20/15 8:15 PM			15.7	70.7	100.1	41.93	100079	1259	S1-2
5/20/15 9:15 PM		2.794	14.4	72.9	101.3	41.59	101292	1198	S1-2
5/20/15 10:15 PM		0.268	13.9	73.6	101.8	41.24	101843	1172	S1-2
5/20/15 11:15 PM		0.268	13.4	74.0	102.2	41.76	102161	1137	S1-2
5/21/15 12:15 AM		0.268	12.7	73.0	102.5	41.73	102539	1071	S1-2
5/21/15 1:15 AM		0.268	12.0	73.7	102.9	42.59	102858	1037	S1-2
5/21/15 2:15 AM		0.268	11.7	74.6	103.1	41.25	103113	1027	S1-2
5/21/15 3:15 AM		0.268	12.0	75.0	103.1	41.92	103108	1049	S1-2
5/21/15 4:15 AM		0.268	12.1	75.8	103.0	41.02	102971	1071	S1-2
5/21/15 5:15 AM		0.268	12.5	75.5	102.7	41.20	102735	1095	S1-2
5/21/15 6:15 AM		0.268	12.5	75.8	102.6	41.11	102607	1102	S1-2
5/20/15 8:15 PM		2.943	15.7	70.7	100.1	172.54	100079	1259	S1-3
5/20/15 9:15 PM		2.561	14.4	72.9	101.3	202.39	101292	1198	S1-3
5/20/15 10:15 PM		1.830	13.9	73.6	101.8	158.83	101843	1172	S1-3
5/20/15 11:15 PM		1.589	13.4	74.0	102.2	156.94	102161	1137	S1-3
5/21/15 12:15 AM		1.418	12.7	73.0	102.5	148.88	102539	1071	S1-3
5/21/15 1:15 AM		1.251	12.0	73.7	102.9	133.61	102858	1037	S1-3
5/21/15 2:15 AM		1.646	11.7	74.6	103.1	144.29	103113	1027	S1-3
5/21/15 3:15 AM		1.228	12.0	75.0	103.1	160.43	103108	1049	S1-3
5/21/15 4:15 AM		1.420	12.1	75.8	103.0	139.53	102971	1071	S1-3

5/21/15 5:15 AM	1.591	12.5	75.5	102.7	146.84	102735	1095	S1-3
5/21/15 6:15 AM	1.309	12.5	75.8	102.6	149.04	102607	1102	S1-3
5/20/15 8:15 PM	0.268	15.7	70.7	100.1	180.30	100079	1259	S1-4
5/20/15 9:15 PM	0.268	14.4	72.9	101.3	180.30	101292	1198	S1-4
5/20/15 10:15 PM	0.268	13.9	73.6	101.8	180.30	101843	1172	S1-4
5/20/15 11:15 PM	0.268	13.4	74.0	102.2	180.30	102161	1137	S1-4
5/21/15 12:15 AM	0.268	12.7	73.0	102.5	180.30	102539	1071	S1-4
5/21/15 1:15 AM	0.268	12.0	73.7	102.9	180.30	102858	1037	S1-4
5/21/15 2:15 AM	0.268	11.7	74.6	103.1	180.29	103113	1027	S1-4
5/21/15 3:15 AM	0.268	12.0	75.0	103.1	180.30	103108	1049	S1-4
5/21/15 4:15 AM	0.268	12.1	75.8	103.0	180.29	102971	1071	S1-4
5/21/15 5:15 AM	0.268	12.5	75.5	102.7	180.29	102735	1095	S1-4
5/21/15 6:15 AM	0.268	12.5	75.8	102.6	180.29	102607	1102	S1-4
5/20/15 8:15 PM	3.273	16.0	88.1	100.4	119.87	100431	1602	S2-5
5/20/15 9:15 PM	3.227	14.4	94.4	102.0	125.43	102027	1549	S2-5
5/20/15 10:15 PM	3.053	14.2	94.3	102.7	115.00	102665	1531	S2-5
5/20/15 11:15 PM	2.882	13.8	93.9	102.9	121.03	102892	1480	S2-5
5/21/15 12:15 AM	2.716	13.1	92.4	103.3	121.18	103291	1391	S2-5
5/21/15 1:15 AM	2.705	12.4	93.5	103.6	118.81	103640	1346	S2-5
5/21/15 2:15 AM	2.859	12.1	95.5	103.9	117.94	103874	1347	S2-5
5/21/15 3:15 AM	2.787	12.3	96.0	103.8	118.84	103826	1376	S2-5
5/21/15 4:15 AM	1.328	12.2	94.5	103.5	136.48	103453	1340	S2-5
5/21/15 5:15 AM	1.163	12.2	92.0	102.9	140.98	102896	1305	S2-5
5/21/15 6:15 AM	1.448	12.7	92.3	102.5	140.53	102547	1357	S2-5
5/20/15 8:15 PM		15.8	65.9	101.3		101295	1185	S2-1R
5/20/15 9:15 PM		14.3	70.6	102.5		102489	1152	S2-1R
5/20/15 10:15 PM		14.4	70.1	102.7		102665	1148	S2-1R
5/20/15 11:15 PM		13.8	69.6	103.0		103041	1102	S2-1R
5/21/15 12:15 AM		13.2	68.1	103.5		103485	1034	S2-1R
5/21/15 1:15 AM		12.5	69.3	103.8		103815	1007	S2-1R
5/21/15 2:15 AM		12.3	70.8	104.0		103952	1011	S2-1R
5/21/15 3:15 AM		12.5	71.6	103.6		103640	1035	S2-1R
5/21/15 4:15 AM		12.3	70.4	103.4		103355	1007	S2-1R
5/21/15 5:15 AM		12.5	68.5	103.0		102981	996	S2-1R
5/21/15 6:15 AM		12.9	68.5	102.9		102852	1017	S2-1R
5/20/15 8:15 PM	2.179	16.0	88.1	100.4	220.12	100431	1602	S2-2
5/20/15 9:15 PM	2.066	14.4	94.4	102.0	219.57	102027	1549	S2-2
5/20/15 10:15 PM	2.048	14.2	94.3	102.7	221.54	102665	1531	S2-2
5/20/15 11:15 PM	2.119	13.8	93.9	102.9	216.99	102892	1480	S2-2
5/21/15 12:15 AM	1.979	13.1	92.4	103.3	213.85	103291	1391	S2-2
5/21/15 1:15 AM	1.861	12.4	93.5	103.6	218.89	103640	1346	S2-2
5/21/15 2:15 AM	1.908	12.1	95.5	103.9	224.09	103874	1347	S2-2
5/21/15 3:15 AM	1.958	12.3	96.0	103.8	214.24	103826	1376	S2-2
5/21/15 4:15 AM	1.358	12.2	94.5	103.5	217.91	103453	1340	S2-2
5/21/15 5:15 AM	1.360	12.2	92.0	102.9	219.53	102896	1305	S2-2
5/21/15 6:15 AM	1.444	12.7	92.3	102.5	217.76	102547	1357	S2-2
5/20/15 8:15 PM	2.222	16.0	88.1	100.4	171.69	100431	1602	S2-3
5/20/15 9:15 PM	2.016	14.4	94.4	102.0	179.20	102027	1549	S2-3
5/20/15 10:15 PM	1.648	14.2	94.3	102.7	150.06	102665	1531	S2-3
5/20/15 11:15 PM	1.613	13.8	93.9	102.9	140.42	102892	1480	S2-3
5/21/15 12:15 AM	1.541	13.1	92.4	103.3	133.54	103291	1391	S2-3
5/21/15 1:15 AM	1.324	12.4	93.5	103.6	124.86	103640	1346	S2-3
5/21/15 2:15 AM	1.547	12.1	95.5	103.9	141.21	103874	1347	S2-3
5/21/15 3:15 AM	1.304	12.3	96.0	103.8	147.36	103826	1376	S2-3
5/21/15 4:15 AM	1.066	12.2	94.5	103.5	140.17	103453	1340	S2-3
5/21/15 5:15 AM	1.222	12.2	92.0	102.9	145.43	102896	1305	S2-3
5/21/15 6:15 AM	1.157	12.7	92.3	102.5	143.18	102547	1357	S2-3

5/20/15 8:15 PM	3.044	16.0	88.1	100.4	180.84	100431	1602	S2-4
5/20/15 9:15 PM	2.765	14.4	94.4	102.0	201.65	102027	1549	S2-4
5/20/15 10:15 PM	2.040	14.2	94.3	102.7	150.92	102665	1531	S2-4
5/20/15 11:15 PM	1.829	13.8	93.9	102.9	146.48	102892	1480	S2-4
5/21/15 12:15 AM	1.632	13.1	92.4	103.3	124.51	103291	1391	S2-4
5/21/15 1:15 AM	1.440	12.4	93.5	103.6	127.18	103640	1346	S2-4
5/21/15 2:15 AM	1.726	12.1	95.5	103.9	137.11	103874	1347	S2-4
5/21/15 3:15 AM	1.382	12.3	96.0	103.8	140.44	103826	1376	S2-4
5/21/15 4:15 AM	1.361	12.2	94.5	103.5	131.93	103453	1340	S2-4
5/21/15 5:15 AM	1.544	12.2	92.0	102.9	146.18	102896	1305	S2-4
5/21/15 6:15 AM	1.292	12.7	92.3	102.5	142.75	102547	1357	S2-4
5/20/15 8:15 PM		15.2	63.7	101.1		101123	1103	S3
5/20/15 9:15 PM		13.3	69.9	102.3		102325	1069	S3
5/20/15 10:15 PM		13.4	73.3	102.6		102586	1127	S3
5/20/15 11:15 PM		13.3	73.4	102.9		102850	1124	S3
5/21/15 12:15 AM		12.7	72.1	103.3		103316	1061	S3
5/21/15 1:15 AM		12.2	73.2	103.7		103666	1041	S3
5/21/15 2:15 AM		11.7	75.1	103.7		103735	1035	S3
5/21/15 3:15 AM		11.9	76.6	103.5		103546	1069	S3
5/21/15 4:15 AM		12.2	77.6	103.3		103260	1105	S3
5/21/15 5:15 AM		12.3	74.3	103.0		103034	1060	S3
5/21/15 6:15 AM		12.8	74.9	102.8		102809	1105	S3
5/20/15 8:15 PM		16.4	61.3	101.4		101393	1147	S4
5/20/15 9:15 PM		14.8	66.6	102.5		102517	1122	S4
5/20/15 10:15 PM		14.5	66.5	103.0		102991	1100	S4
5/20/15 11:15 PM		14.0	66.4	103.1		103138	1062	S4
5/21/15 12:15 AM		13.2	65.0	103.5		103549	989	S4
5/21/15 1:15 AM		12.4	65.8	103.8		103790	947	S4
5/21/15 2:15 AM		12.2	67.6	103.9		103875	957	S4
5/21/15 3:15 AM		12.4	68.3	103.7		103665	983	S4
5/21/15 4:15 AM		11.9	69.7	103.2		103230	973	S4
5/21/15 5:15 AM		12.0	67.4	102.8		102761	942	S4
5/21/15 6:15 AM		12.4	67.2	102.1		102117	969	S4
5/20/15 8:15 PM	1.041	14.7	65.1	99.4	194.22	99447	1094	S5-5
5/20/15 9:15 PM	0.862	12.7	67.6	101.2	194.55	101200	990	S5-5
5/20/15 10:15 PM	1.626	12.7	69.4	101.6	200.36	101591	1022	S5-5
5/20/15 11:15 PM	1.648	12.7	68.3	102.0	201.64	102008	1002	S5-5
5/21/15 12:15 AM	1.619	12.1	66.1	102.5	203.08	102469	934	S5-5
5/21/15 1:15 AM	1.295	11.5	66.1	102.7	206.64	102688	900	S5-5
5/21/15 2:15 AM	1.375	11.1	68.0	102.8	200.46	102759	899	S5-5
5/21/15 3:15 AM	1.371	11.3	69.4	102.6	204.79	102650	928	S5-5
5/21/15 4:15 AM	0.605	11.5	67.5	102.2	235.96	102178	916	S5-5
5/21/15 5:15 AM	0.616	11.5	66.4	101.5	221.33	101463	904	S5-5
5/21/15 6:15 AM	0.554	12.2	65.7	101.0	226.52	101043	932	S5-5
5/20/15 8:15 PM	1.750	14.7	65.1	99.4	103.09	99447	1094	S5-2
5/20/15 9:15 PM	1.250	12.7	67.6	101.2	119.88	101200	990	S5-2
5/20/15 10:15 PM	1.834	12.7	69.4	101.6	100.41	101591	1022	S5-2
5/20/15 11:15 PM	1.872	12.7	68.3	102.0	106.33	102008	1002	S5-2
5/21/15 12:15 AM	1.859	12.1	66.1	102.5	112.64	102469	934	S5-2
5/21/15 1:15 AM	1.549	11.5	66.1	102.7	106.65	102688	900	S5-2
5/21/15 2:15 AM	1.632	11.1	68.0	102.8	109.20	102759	899	S5-2
5/21/15 3:15 AM	1.623	11.3	69.4	102.6	114.55	102650	928	S5-2
5/21/15 4:15 AM	0.824	11.5	67.5	102.2	133.80	102178	916	S5-2
5/21/15 5:15 AM	0.885	11.5	66.4	101.5	139.72	101463	904	S5-2
5/21/15 6:15 AM	0.833	12.2	65.7	101.0	132.88	101043	932	S5-2
5/20/15 8:15 PM	2.402	14.7	65.1	99.4	107.91	99447	1094	S5-3

5/20/15 9:15 PM	1.832	12.7	67.6	101.2	123.73	101200	990	S5-3
5/20/15 10:15 PM	1.782	12.7	69.4	101.6	114.31	101591	1022	S5-3
5/20/15 11:15 PM	1.773	12.7	68.3	102.0	119.85	102008	1002	S5-3
5/21/15 12:15 AM	1.763	12.1	66.1	102.5	117.25	102469	934	S5-3
5/21/15 1:15 AM	1.372	11.5	66.1	102.7	123.72	102688	900	S5-3
5/21/15 2:15 AM	1.593	11.1	68.0	102.8	114.94	102759	899	S5-3
5/21/15 3:15 AM	1.479	11.3	69.4	102.6	125.18	102650	928	S5-3
5/21/15 4:15 AM	1.125	11.5	67.5	102.2	135.57	102178	916	S5-3
5/21/15 5:15 AM	1.261	11.5	66.4	101.5	146.91	101463	904	S5-3
5/21/15 6:15 AM	1.120	12.2	65.7	101.0	144.04	101043	932	S5-3
5/20/15 8:15 PM	3.022	14.7	65.1	99.4	123.08	99447	1094	S5-4
5/20/15 9:15 PM	2.521	12.7	67.6	101.2	131.65	101200	990	S5-4
5/20/15 10:15 PM	2.016	12.7	69.4	101.6	124.91	101591	1022	S5-4
5/20/15 11:15 PM	1.874	12.7	68.3	102.0	116.88	102008	1002	S5-4
5/21/15 12:15 AM	1.790	12.1	66.1	102.5	121.04	102469	934	S5-4
5/21/15 1:15 AM	1.433	11.5	66.1	102.7	126.34	102688	900	S5-4
5/21/15 2:15 AM	1.714	11.1	68.0	102.8	126.10	102759	899	S5-4
5/21/15 3:15 AM	1.439	11.3	69.4	102.6	125.32	102650	928	S5-4
5/21/15 4:15 AM	1.362	11.5	67.5	102.2	135.13	102178	916	S5-4
5/21/15 5:15 AM	1.466	11.5	66.4	101.5	147.76	101463	904	S5-4
5/21/15 6:15 AM	1.232	12.2	65.7	101.0	145.52	101043	932	S5-4
5/20/15 8:15 PM		15.0	61.9	100.4		100395	1056	S6
5/20/15 9:15 PM		13.0	68.6	101.3		101289	1025	S6
5/20/15 10:15 PM		12.7	69.5	101.6		101554	1022	S6
5/20/15 11:15 PM		12.8	69.4	101.9		101912	1025	S6
5/21/15 12:15 AM		12.3	69.4	102.5		102541	992	S6
5/21/15 1:15 AM		11.9	70.2	103.1		103070	980	S6
5/21/15 2:15 AM		11.4	71.4	103.3		103286	961	S6
5/21/15 3:15 AM		11.5	72.7	102.8		102818	985	S6
5/21/15 4:15 AM		11.8	71.4	102.4		102393	992	S6
5/21/15 5:15 AM		11.9	69.3	102.4		102382	966	S6
5/21/15 6:15 AM		12.4	69.3	102.0		102015	997	S6
5/20/15 8:15 PM								S7
5/20/15 9:15 PM								S7
5/20/15 10:15 PM								S7
5/20/15 11:15 PM								S7
5/21/15 12:15 AM								S7
5/21/15 1:15 AM								S7
5/21/15 2:15 AM								S7
5/21/15 3:15 AM								S7
5/21/15 4:15 AM								S7
5/21/15 5:15 AM								S7
5/21/15 6:15 AM								S7

DE07

t	WS	T	RH	P	WD	p.air	p,wv	sample point
date	[m/s]	[C]	[%]	[KPa]	[deg]	[Pa]	[Pa]	
5/22/15 8:20 AM	2.688	16.2	75.1	101.9	165.25	101857	1387	S1-5
5/22/15 9:20 AM	3.221	18.1	67.1	99.7	167.56	99711	1395	S1-5
5/22/15 10:20 AM	3.132	20.0	60.3	98.7	167.30	98684	1405	S1-5
5/22/15 11:20 AM	3.296	21.4	57.3	97.0	167.16	96983	1459	S1-5
5/22/15 12:20 PM	3.502	22.4	56.8	95.8	168.28	95803	1543	S1-5
5/22/15 1:20 PM	3.775	22.9	57.3	94.7	169.86	94749	1603	S1-5
5/22/15 2:20 PM	4.088	22.2	57.6	94.9	169.22	94917	1545	S1-5
5/22/15 3:20 PM	4.161	22.1	57.2	95.0	170.21	95015	1526	S1-5
5/22/15 4:20 PM	4.158	21.3	58.9	95.5	169.16	95534	1495	S1-5
5/22/15 5:20 PM	3.693	20.5	60.9	96.3	167.92	96304	1473	S1-5
5/22/15 6:20 PM	3.452	19.6	62.9	97.3	169.03	97317	1437	S1-5

5/22/15 8:20 AM	0.268	16.2	75.1	101.9	41.47	101857	1387	S1-2
5/22/15 9:20 AM	0.268	18.1	67.1	99.7	41.71	99711	1395	S1-2
5/22/15 10:20 AM	0.268	20.0	60.3	98.7	41.37	98684	1405	S1-2
5/22/15 11:20 AM	0.268	21.4	57.3	97.0	40.87	96983	1459	S1-2
5/22/15 12:20 PM	0.268	22.4	56.8	95.8	41.10	95803	1543	S1-2
5/22/15 1:20 PM	0.268	22.9	57.3	94.7	40.75	94749	1603	S1-2
5/22/15 2:20 PM	0.268	22.2	57.6	94.9	40.84	94917	1545	S1-2
5/22/15 3:20 PM	0.268	22.1	57.2	95.0	40.63	95015	1526	S1-2
5/22/15 4:20 PM	0.268	21.3	58.9	95.5	40.87	95534	1495	S1-2
5/22/15 5:20 PM	0.268	20.5	60.9	96.3	41.48	96304	1473	S1-2
5/22/15 6:20 PM	0.268	19.6	62.9	97.3	41.16	97317	1437	S1-2
5/22/15 8:20 AM	4.825	16.2	75.1	101.9	246.36	101857	1387	S1-3
5/22/15 9:20 AM	5.110	18.1	67.1	99.7	233.84	99711	1395	S1-3
5/22/15 10:20 AM	4.947	20.0	60.3	98.7	236.93	98684	1405	S1-3
5/22/15 11:20 AM	5.088	21.4	57.3	97.0	241.18	96983	1459	S1-3
5/22/15 12:20 PM	5.049	22.4	56.8	95.8	235.70	95803	1543	S1-3
5/22/15 1:20 PM	5.342	22.9	57.3	94.7	231.67	94749	1603	S1-3
5/22/15 2:20 PM	5.354	22.2	57.6	94.9	230.50	94917	1545	S1-3
5/22/15 3:20 PM	4.909	22.1	57.2	95.0	224.91	95015	1526	S1-3
5/22/15 4:20 PM	4.889	21.3	58.9	95.5	225.98	95534	1495	S1-3
5/22/15 5:20 PM	4.345	20.5	60.9	96.3	222.13	96304	1473	S1-3
5/22/15 6:20 PM	3.819	19.6	62.9	97.3	221.00	97317	1437	S1-3
5/22/15 8:20 AM	0.268	16.2	75.1	101.9	180.29	101857	1387	S1-4
5/22/15 9:20 AM	0.268	18.1	67.1	99.7	180.30	99711	1395	S1-4
5/22/15 10:20 AM	0.268	20.0	60.3	98.7	180.30	98684	1405	S1-4
5/22/15 11:20 AM	0.268	21.4	57.3	97.0	180.30	96983	1459	S1-4
5/22/15 12:20 PM	0.268	22.4	56.8	95.8	180.30	95803	1543	S1-4
5/22/15 1:20 PM	0.268	22.9	57.3	94.7	180.30	94749	1603	S1-4
5/22/15 2:20 PM	0.268	22.2	57.6	94.9	180.29	94917	1545	S1-4
5/22/15 3:20 PM	0.268	22.1	57.2	95.0	180.30	95015	1526	S1-4
5/22/15 4:20 PM	0.268	21.3	58.9	95.5	180.30	95534	1495	S1-4
5/22/15 5:20 PM	0.268	20.5	60.9	96.3	180.30	96304	1473	S1-4
5/22/15 6:20 PM	0.268	19.6	62.9	97.3	180.30	97317	1437	S1-4
5/22/15 8:20 AM	2.296	17.4	88.2	100.9	237.71	100857	1753	S2-5
5/22/15 9:20 AM	2.306	19.8	76.2	97.2	237.75	97204	1755	S2-5
5/22/15 10:20 AM	2.391	22.0	66.9	94.8	238.34	94803	1763	S2-5
5/22/15 11:20 AM	2.502	22.5	62.7	93.3	232.99	93328	1710	S2-5
5/22/15 12:20 PM	2.626	23.1	61.4	92.5	226.43	92468	1735	S2-5
5/22/15 1:20 PM	2.966	23.6	59.2	92.1	230.88	92096	1721	S2-5
5/22/15 2:20 PM	3.002	24.2	53.3	92.2	231.19	92158	1608	S2-5
5/22/15 3:20 PM	3.312	24.1	51.8	92.4	231.48	92367	1558	S2-5
5/22/15 4:20 PM	3.332	24.1	50.4	93.3	224.66	93276	1515	S2-5
5/22/15 5:20 PM	2.901	24.0	50.6	94.5	219.87	94464	1513	S2-5
5/22/15 6:20 PM	2.571	22.3	55.4	96.2	217.27	96242	1492	S2-5
5/22/15 8:20 AM		17.0	66.2	100.2		100249	1286	S2-1R
5/22/15 9:20 AM		19.4	59.2	97.7		97712	1331	S2-1R
5/22/15 10:20 AM		20.1	55.0	96.3		96344	1292	S2-1R
5/22/15 11:20 AM		21.3	50.7	95.9		95852	1284	S2-1R
5/22/15 12:20 PM		23.4	48.2	95.8		95785	1389	S2-1R
5/22/15 1:20 PM		24.1	46.5	96.9		96909	1395	S2-1R
5/22/15 2:20 PM		25.8	37.4	95.0		95006	1241	S2-1R
5/22/15 3:20 PM		25.8	36.9	94.7		94694	1226	S2-1R
5/22/15 4:20 PM		25.6	37.1	95.1		95055	1216	S2-1R
5/22/15 5:20 PM		25.3	36.9	95.4		95398	1192	S2-1R
5/22/15 6:20 PM		23.0	39.7	97.0		97034	1117	S2-1R
5/22/15 8:20 AM	2.707	17.4	88.2	100.9	220.13	100857	1753	S2-2
5/22/15 9:20 AM	2.745	19.8	76.2	97.2	223.74	97204	1755	S2-2

5/22/15 10:20 AM	2.838	22.0	66.9	94.8	224.37	94803	1763	S2-2
5/22/15 11:20 AM	2.963	22.5	62.7	93.3	222.16	93328	1710	S2-2
5/22/15 12:20 PM	3.155	23.1	61.4	92.5	224.30	92468	1735	S2-2
5/22/15 1:20 PM	3.571	23.6	59.2	92.1	224.24	92096	1721	S2-2
5/22/15 2:20 PM	3.650	24.2	53.3	92.2	220.16	92158	1608	S2-2
5/22/15 3:20 PM	4.060	24.1	51.8	92.4	221.85	92367	1558	S2-2
5/22/15 4:20 PM	4.084	24.1	50.4	93.3	224.19	93276	1515	S2-2
5/22/15 5:20 PM	3.585	24.0	50.6	94.5	217.96	94464	1513	S2-2
5/22/15 6:20 PM	3.194	22.3	55.4	96.2	222.67	96242	1492	S2-2
5/22/15 8:20 AM	3.832	17.4	88.2	100.9	245.74	100857	1753	S2-3
5/22/15 9:20 AM	3.867	19.8	76.2	97.2	249.31	97204	1755	S2-3
5/22/15 10:20 AM	3.918	22.0	66.9	94.8	241.23	94803	1763	S2-3
5/22/15 11:20 AM	3.998	22.5	62.7	93.3	239.35	93328	1710	S2-3
5/22/15 12:20 PM	4.060	23.1	61.4	92.5	235.86	92468	1735	S2-3
5/22/15 1:20 PM	4.452	23.6	59.2	92.1	228.72	92096	1721	S2-3
5/22/15 2:20 PM	4.441	24.2	53.3	92.2	231.65	92158	1608	S2-3
5/22/15 3:20 PM	4.702	24.1	51.8	92.4	226.36	92367	1558	S2-3
5/22/15 4:20 PM	4.684	24.1	50.4	93.3	225.20	93276	1515	S2-3
5/22/15 5:20 PM	4.195	24.0	50.6	94.5	224.69	94464	1513	S2-3
5/22/15 6:20 PM	3.687	22.3	55.4	96.2	218.94	96242	1492	S2-3
5/22/15 8:20 AM	4.874	17.4	88.2	100.9	240.34	100857	1753	S2-4
5/22/15 9:20 AM	5.023	19.8	76.2	97.2	239.73	97204	1755	S2-4
5/22/15 10:20 AM	5.045	22.0	66.9	94.8	245.21	94803	1763	S2-4
5/22/15 11:20 AM	5.086	22.5	62.7	93.3	237.49	93328	1710	S2-4
5/22/15 12:20 PM	5.047	23.1	61.4	92.5	235.37	92468	1735	S2-4
5/22/15 1:20 PM	5.355	23.6	59.2	92.1	228.12	92096	1721	S2-4
5/22/15 2:20 PM	5.371	24.2	53.3	92.2	229.79	92158	1608	S2-4
5/22/15 3:20 PM	5.303	24.1	51.8	92.4	223.08	92367	1558	S2-4
5/22/15 4:20 PM	5.269	24.1	50.4	93.3	224.01	93276	1515	S2-4
5/22/15 5:20 PM	4.730	24.0	50.6	94.5	217.23	94464	1513	S2-4
5/22/15 6:20 PM	4.110	22.3	55.4	96.2	217.95	96242	1492	S2-4
5/22/15 8:20 AM		15.9	73.5	100.3		100280	1323	S3
5/22/15 9:20 AM		18.8	61.3	97.8		97819	1332	S3
5/22/15 10:20 AM		20.9	65.9	97.6		97606	1631	S3
5/22/15 11:20 AM		23.1	51.5	97.5		97504	1453	S3
5/22/15 12:20 PM		24.2	47.1	95.5		95507	1425	S3
5/22/15 1:20 PM		24.9	47.1	94.7		94693	1483	S3
5/22/15 2:20 PM		25.7	41.2	94.5		94500	1363	S3
5/22/15 3:20 PM		25.7	37.3	94.6		94598	1231	S3
5/22/15 4:20 PM		25.4	36.3	95.0		94969	1177	S3
5/22/15 5:20 PM		24.7	37.6	95.3		95301	1174	S3
5/22/15 6:20 PM		23.0	47.7	96.7		96723	1337	S3
5/22/15 8:20 AM		16.1	70.4	101.1		101081	1286	S4
5/22/15 9:20 AM		18.5	60.5	98.1		98146	1290	S4
5/22/15 10:20 AM		20.8	60.0	96.3		96297	1478	S4
5/22/15 11:20 AM		22.5	49.5	95.4		95415	1351	S4
5/22/15 12:20 PM		23.7	47.1	95.0		94974	1383	S4
5/22/15 1:20 PM		24.2	46.8	94.9		94875	1413	S4
5/22/15 2:20 PM		25.1	41.6	94.7		94722	1326	S4
5/22/15 3:20 PM		24.9	38.6	94.9		94948	1217	S4
5/22/15 4:20 PM		24.8	36.7	95.5		95468	1148	S4
5/22/15 5:20 PM		24.4	38.1	96.2		96169	1167	S4
5/22/15 6:20 PM		22.9	44.9	97.4		97408	1249	S4
5/22/15 8:20 AM	1.914	16.9	66.4	99.8	177.81	99805	1279	S5-5
5/22/15 9:20 AM	1.737	20.0	62.9	95.7	172.53	95662	1466	S5-5
5/22/15 10:20 AM	1.812	22.3	52.6	93.1	174.78	93069	1419	S5-5
5/22/15 11:20 AM	1.660	23.7	50.0	91.5	174.36	91467	1467	S5-5

5/22/15 12:20 PM	0.939	24.3	50.2	89.8	173.73	89849	1526	S5-5
5/22/15 1:20 PM	0.988	23.9	50.2	89.3	173.30	89320	1489	S5-5
5/22/15 2:20 PM	0.919	24.3	48.3	88.9	172.06	88933	1466	S5-5
5/22/15 3:20 PM	0.849	24.5	45.8	88.7	164.21	88731	1405	S5-5
5/22/15 4:20 PM	0.745	24.1	43.4	90.1	167.37	90051	1308	S5-5
5/22/15 5:20 PM	0.754	24.6	41.1	91.9	160.29	91925	1275	S5-5
5/22/15 6:20 PM	0.544	22.2	48.2	93.4	155.14	93439	1292	S5-5
5/22/15 8:20 AM	2.591	16.9	66.4	99.8	236.63	99805	1279	S5-2
5/22/15 9:20 AM	2.319	20.0	62.9	95.7	227.39	95662	1466	S5-2
5/22/15 10:20 AM	2.449	22.3	52.6	93.1	234.80	93069	1419	S5-2
5/22/15 11:20 AM	2.398	23.7	50.0	91.5	231.22	91467	1467	S5-2
5/22/15 12:20 PM	2.078	24.3	50.2	89.8	224.89	89849	1526	S5-2
5/22/15 1:20 PM	2.365	23.9	50.2	89.3	221.85	89320	1489	S5-2
5/22/15 2:20 PM	2.226	24.3	48.3	88.9	222.84	88933	1466	S5-2
5/22/15 3:20 PM	2.631	24.5	45.8	88.7	221.61	88731	1405	S5-2
5/22/15 4:20 PM	2.762	24.1	43.4	90.1	217.93	90051	1308	S5-2
5/22/15 5:20 PM	2.731	24.6	41.1	91.9	103.96	91925	1275	S5-2
5/22/15 6:20 PM	2.436	22.2	48.2	93.4	101.50	93439	1292	S5-2
5/22/15 8:20 AM	4.253	16.9	66.4	99.8	241.98	99805	1279	S5-3
5/22/15 9:20 AM	4.139	20.0	62.9	95.7	240.98	95662	1466	S5-3
5/22/15 10:20 AM	4.054	22.3	52.6	93.1	243.99	93069	1419	S5-3
5/22/15 11:20 AM	4.241	23.7	50.0	91.5	244.95	91467	1467	S5-3
5/22/15 12:20 PM	3.979	24.3	50.2	89.8	238.22	89849	1526	S5-3
5/22/15 1:20 PM	4.260	23.9	50.2	89.3	234.08	89320	1489	S5-3
5/22/15 2:20 PM	4.283	24.3	48.3	88.9	231.95	88933	1466	S5-3
5/22/15 3:20 PM	4.413	24.5	45.8	88.7	235.23	88731	1405	S5-3
5/22/15 4:20 PM	4.361	24.1	43.4	90.1	232.05	90051	1308	S5-3
5/22/15 5:20 PM	4.018	24.6	41.1	91.9	233.69	91925	1275	S5-3
5/22/15 6:20 PM	3.391	22.2	48.2	93.4	228.24	93439	1292	S5-3
5/22/15 8:20 AM	5.055	16.9	66.4	99.8	235.90	99805	1279	S5-4
5/22/15 9:20 AM	5.075	20.0	62.9	95.7	235.62	95662	1466	S5-4
5/22/15 10:20 AM	4.926	22.3	52.6	93.1	242.01	93069	1419	S5-4
5/22/15 11:20 AM	5.274	23.7	50.0	91.5	234.54	91467	1467	S5-4
5/22/15 12:20 PM	5.125	24.3	50.2	89.8	243.24	89849	1526	S5-4
5/22/15 1:20 PM	5.342	23.9	50.2	89.3	236.37	89320	1489	S5-4
5/22/15 2:20 PM	5.452	24.3	48.3	88.9	233.93	88933	1466	S5-4
5/22/15 3:20 PM	5.416	24.5	45.8	88.7	227.35	88731	1405	S5-4
5/22/15 4:20 PM	5.279	24.1	43.4	90.1	220.07	90051	1308	S5-4
5/22/15 5:20 PM	4.701	24.6	41.1	91.9	221.91	91925	1275	S5-4
5/22/15 6:20 PM	3.990	22.2	48.2	93.4	220.74	93439	1292	S5-4
5/22/15 8:20 AM		16.5	71.0	99.4		99406	1327	S6
5/22/15 9:20 AM		19.1	59.8	97.2		97238	1323	S6
5/22/15 10:20 AM		20.7	56.3	96.5		96522	1377	S6
5/22/15 11:20 AM		22.4	48.3	96.8		96828	1309	S6
5/22/15 12:20 PM		23.8	46.0	95.9		95902	1354	S6
5/22/15 1:20 PM		23.6	46.2	95.8		95779	1343	S6
5/22/15 2:20 PM		22.4	44.9	96.0		95964	1213	S6
5/22/15 3:20 PM		22.0	45.1	97.3		97292	1194	S6
5/22/15 4:20 PM		21.9	43.7	98.2		98188	1152	S6
5/22/15 5:20 PM		21.7	44.9	98.3		98280	1169	S6
5/22/15 6:20 PM		21.2	46.5	98.5		98505	1174	S6
5/22/15 8:20 AM								S7
5/22/15 9:20 AM								S7
5/22/15 10:20 AM								S7
5/22/15 11:20 AM								S7
5/22/15 12:20 PM								S7
5/22/15 1:20 PM								S7

5/22/15 2:20 PM									S7
5/22/15 3:20 PM									S7
5/22/15 4:20 PM									S7
5/22/15 5:20 PM									S7
5/22/15 6:20 PM									S7

DE08

t	WS	T	RH	P	WD	p.air	p,wv	sample point	
date	[m/s]	[C]	[%]	[KPa]	[deg]	[Pa]	[Pa]		
5/22/15 8:00 PM		0.878	17.0	72.0	99.6	163.42	99596	1398	S1-5
5/22/15 9:00 PM		1.100	16.5	72.3	100.7	163.52	100677	1358	S1-5
5/22/15 10:00 PM		1.066	16.2	73.0	101.0	169.17	101048	1349	S1-5
5/22/15 11:00 PM		1.167	15.5	75.0	101.5	164.71	101461	1321	S1-5
5/23/15 12:00 AM		1.629	15.4	75.3	101.9	164.35	101887	1317	S1-5
5/23/15 1:00 AM		1.510	15.0	73.4	102.1	164.54	102117	1251	S1-5
5/23/15 2:00 AM		1.239	13.7	72.4	102.8	182.08	102789	1137	S1-5
5/23/15 3:00 AM		1.304	12.3	69.5	103.6	181.92	103640	995	S1-5
5/23/15 4:00 AM		1.508	11.3	68.6	104.5	175.46	104538	916	S1-5
5/23/15 5:00 AM		1.540	10.6	70.3	105.1	182.63	105065	897	S1-5
5/23/15 6:00 AM		1.420	10.1	72.9	105.6	187.16	105610	904	S1-5
5/22/15 8:00 PM		0.268	17.0	72.0	99.6	44.03	99596	1398	S1-2
5/22/15 9:00 PM		0.268	16.5	72.3	100.7	41.68	100677	1358	S1-2
5/22/15 10:00 PM		0.268	16.2	73.0	101.0	41.56	101048	1349	S1-2
5/22/15 11:00 PM		0.268	15.5	75.0	101.5	41.50	101461	1321	S1-2
5/23/15 12:00 AM		0.268	15.4	75.3	101.9	41.44	101887	1317	S1-2
5/23/15 1:00 AM		0.268	15.0	73.4	102.1	41.60	102117	1251	S1-2
5/23/15 2:00 AM		0.268	13.7	72.4	102.8	41.31	102789	1137	S1-2
5/23/15 3:00 AM		0.268	12.3	69.5	103.6	41.59	103640	995	S1-2
5/23/15 4:00 AM		0.268	11.3	68.6	104.5	41.51	104538	916	S1-2
5/23/15 5:00 AM		0.268	10.6	70.3	105.1	41.53	105065	897	S1-2
5/23/15 6:00 AM		0.268	10.1	72.9	105.6	42.00	105610	904	S1-2
5/22/15 8:00 PM		1.805	17.0	72.0	99.6	217.92	99596	1398	S1-3
5/22/15 9:00 PM		1.553	16.5	72.3	100.7	220.05	100677	1358	S1-3
5/22/15 10:00 PM		1.277	16.2	73.0	101.0	218.98	101048	1349	S1-3
5/22/15 11:00 PM		1.460	15.5	75.0	101.5	217.30	101461	1321	S1-3
5/23/15 12:00 AM		2.470	15.4	75.3	101.9	235.42	101887	1317	S1-3
5/23/15 1:00 AM		2.825	15.0	73.4	102.1	242.62	102117	1251	S1-3
5/23/15 2:00 AM		2.268	13.7	72.4	102.8	243.18	102789	1137	S1-3
5/23/15 3:00 AM		2.732	12.3	69.5	103.6	250.91	103640	995	S1-3
5/23/15 4:00 AM		3.300	11.3	68.6	104.5	243.66	104538	916	S1-3
5/23/15 5:00 AM		2.750	10.6	70.3	105.1	245.43	105065	897	S1-3
5/23/15 6:00 AM		2.510	10.1	72.9	105.6	227.18	105610	904	S1-3
5/22/15 8:00 PM		0.268	17.0	72.0	99.6	180.30	99596	1398	S1-4
5/22/15 9:00 PM		0.268	16.5	72.3	100.7	180.30	100677	1358	S1-4
5/22/15 10:00 PM		0.268	16.2	73.0	101.0	180.30	101048	1349	S1-4
5/22/15 11:00 PM		0.268	15.5	75.0	101.5	180.30	101461	1321	S1-4
5/23/15 12:00 AM		0.268	15.4	75.3	101.9	180.27	101887	1317	S1-4
5/23/15 1:00 AM		0.268	15.0	73.4	102.1	180.30	102117	1251	S1-4
5/23/15 2:00 AM		0.268	13.7	72.4	102.8	180.30	102789	1137	S1-4
5/23/15 3:00 AM		0.268	12.3	69.5	103.6	180.29	103640	995	S1-4
5/23/15 4:00 AM		0.268	11.3	68.6	104.5	180.30	104538	916	S1-4
5/23/15 5:00 AM		0.268	10.6	70.3	105.1	180.29	105065	897	S1-4
5/23/15 6:00 AM		0.268	10.1	72.9	105.6	180.30	105610	904	S1-4
5/22/15 8:00 PM		2.518	18.3	80.5	98.9	157.00	98851	1692	S2-5
5/22/15 9:00 PM		2.840	17.2	88.1	100.6	144.79	100588	1724	S2-5
5/22/15 10:00 PM		2.959	16.8	91.2	101.2	131.87	101172	1749	S2-5
5/22/15 11:00 PM		2.842	15.9	95.2	101.9	141.68	101864	1717	S2-5
5/23/15 12:00 AM		1.314	14.7	95.5	102.5	199.70	102450	1597	S2-5

5/23/15 1:00 AM	1.018	14.1	91.1	102.5	218.55	102514	1464	S2-5
5/23/15 2:00 AM	2.554	13.2	91.2	103.0	164.97	103037	1387	S2-5
5/23/15 3:00 AM	2.113	11.5	84.2	104.4	205.09	104447	1146	S2-5
5/23/15 4:00 AM	1.900	10.5	77.6	105.7	227.73	105671	982	S2-5
5/23/15 5:00 AM	2.549	9.8	86.2	106.1	167.95	106137	1048	S2-5
5/23/15 6:00 AM	3.205	10.4	92.2	106.4	135.05	106367	1161	S2-5
5/22/15 8:00 PM		18.3	61.4	100.0		99994	1293	S2-1R
5/22/15 9:00 PM		17.3	64.9	101.2		101175	1277	S2-1R
5/22/15 10:00 PM		16.9	67.6	101.4		101396	1304	S2-1R
5/22/15 11:00 PM		16.0	70.9	102.1		102093	1287	S2-1R
5/23/15 12:00 AM		14.6	71.9	102.6		102648	1195	S2-1R
5/23/15 1:00 AM		14.0	67.6	102.7		102720	1078	S2-1R
5/23/15 2:00 AM		13.2	66.9	103.5		103513	1018	S2-1R
5/23/15 3:00 AM		11.5	64.6	104.8		104828	879	S2-1R
5/23/15 4:00 AM		10.5	57.9	105.8		105819	734	S2-1R
5/23/15 5:00 AM		9.9	64.9	106.1		106149	791	S2-1R
5/23/15 6:00 AM		10.4	67.4	106.2		106157	852	S2-1R
5/22/15 8:00 PM	1.764	18.3	80.5	98.9	213.86	98851	1692	S2-2
5/22/15 9:00 PM	1.853	17.2	88.1	100.6	213.81	100588	1724	S2-2
5/22/15 10:00 PM	1.876	16.8	91.2	101.2	213.63	101172	1749	S2-2
5/22/15 11:00 PM	1.804	15.9	95.2	101.9	223.11	101864	1717	S2-2
5/23/15 12:00 AM	1.253	14.7	95.5	102.5	220.30	102450	1597	S2-2
5/23/15 1:00 AM	0.968	14.1	91.1	102.5	229.87	102514	1464	S2-2
5/23/15 2:00 AM	1.924	13.2	91.2	103.0	215.42	103037	1387	S2-2
5/23/15 3:00 AM	2.104	11.5	84.2	104.4	226.00	104447	1146	S2-2
5/23/15 4:00 AM	2.113	10.5	77.6	105.7	223.11	105671	982	S2-2
5/23/15 5:00 AM	1.841	9.8	86.2	106.1	209.67	106137	1048	S2-2
5/23/15 6:00 AM	1.853	10.4	92.2	106.4	206.65	106367	1161	S2-2
5/22/15 8:00 PM	1.782	18.3	80.5	98.9	205.09	98851	1692	S2-3
5/22/15 9:00 PM	1.532	17.2	88.1	100.6	207.78	100588	1724	S2-3
5/22/15 10:00 PM	1.366	16.8	91.2	101.2	213.05	101172	1749	S2-3
5/22/15 11:00 PM	1.449	15.9	95.2	101.9	212.64	101864	1717	S2-3
5/23/15 12:00 AM	1.551	14.7	95.5	102.5	229.63	102450	1597	S2-3
5/23/15 1:00 AM	1.447	14.1	91.1	102.5	241.72	102514	1464	S2-3
5/23/15 2:00 AM	1.952	13.2	91.2	103.0	243.67	103037	1387	S2-3
5/23/15 3:00 AM	2.442	11.5	84.2	104.4	248.77	104447	1146	S2-3
5/23/15 4:00 AM	2.913	10.5	77.6	105.7	249.80	105671	982	S2-3
5/23/15 5:00 AM	2.376	9.8	86.2	106.1	246.50	106137	1048	S2-3
5/23/15 6:00 AM	2.135	10.4	92.2	106.4	218.98	106367	1161	S2-3
5/22/15 8:00 PM	2.211	18.3	80.5	98.9	206.08	98851	1692	S2-4
5/22/15 9:00 PM	1.896	17.2	88.1	100.6	208.13	100588	1724	S2-4
5/22/15 10:00 PM	1.728	16.8	91.2	101.2	206.11	101172	1749	S2-4
5/22/15 11:00 PM	1.861	15.9	95.2	101.9	208.54	101864	1717	S2-4
5/23/15 12:00 AM	2.223	14.7	95.5	102.5	231.50	102450	1597	S2-4
5/23/15 1:00 AM	2.373	14.1	91.1	102.5	231.37	102514	1464	S2-4
5/23/15 2:00 AM	2.461	13.2	91.2	103.0	249.06	103037	1387	S2-4
5/23/15 3:00 AM	2.935	11.5	84.2	104.4	244.13	104447	1146	S2-4
5/23/15 4:00 AM	3.543	10.5	77.6	105.7	242.74	105671	982	S2-4
5/23/15 5:00 AM	2.941	9.8	86.2	106.1	246.96	106137	1048	S2-4
5/23/15 6:00 AM	2.728	10.4	92.2	106.4	236.57	106367	1161	S2-4
5/22/15 8:00 PM		18.3	63.9	99.7		99741	1346	S3
5/22/15 9:00 PM		16.9	62.9	100.9		100864	1214	S3
5/22/15 10:00 PM		16.6	67.6	101.0		101037	1273	S3
5/22/15 11:00 PM		15.5	71.7	101.9		101886	1261	S3
5/23/15 12:00 AM		13.7	77.0	102.3		102267	1208	S3
5/23/15 1:00 AM		13.1	72.2	102.2		102235	1089	S3
5/23/15 2:00 AM		12.4	68.5	103.3		103274	987	S3

5/23/15 3:00 AM		10.8	65.6	104.5		104528	850	S3
5/23/15 4:00 AM		10.1	65.7	105.4		105441	815	S3
5/23/15 5:00 AM		9.2	62.3	106.0		105964	726	S3
5/23/15 6:00 AM		9.5	63.8	105.9		105936	761	S3
5/22/15 8:00 PM		18.5	61.0	100.3		100328	1301	S4
5/22/15 9:00 PM		17.5	61.8	101.3		101250	1238	S4
5/22/15 10:00 PM		17.1	64.0	101.4		101426	1252	S4
5/22/15 11:00 PM		16.1	68.4	102.1		102139	1253	S4
5/23/15 12:00 AM		15.1	72.5	102.8		102763	1244	S4
5/23/15 1:00 AM		14.6	67.9	103.1		103097	1126	S4
5/23/15 2:00 AM		13.6	67.5	103.9		103880	1051	S4
5/23/15 3:00 AM		11.9	62.8	105.0		104989	879	S4
5/23/15 4:00 AM		10.7	63.7	106.0		106038	818	S4
5/23/15 5:00 AM		10.3	62.8	106.5		106470	789	S4
5/23/15 6:00 AM		10.8	64.1	106.3		106290	830	S4
5/22/15 8:00 PM	0.313	18.0	57.6	97.4	163.64	97410	1186	S5-5
5/22/15 9:00 PM	0.368	16.7	67.5	98.8	181.38	98811	1283	S5-5
5/22/15 10:00 PM	0.696	16.3	64.4	99.4	191.61	99360	1194	S5-5
5/22/15 11:00 PM	0.461	14.9	67.8	100.3	178.39	100300	1147	S5-5
5/23/15 12:00 AM	0.283	13.0	73.9	100.9	186.17	100852	1103	S5-5
5/23/15 1:00 AM	0.304	11.9	73.7	101.4	181.61	101386	1028	S5-5
5/23/15 2:00 AM	0.629	11.7	67.3	102.2	186.42	102164	928	S5-5
5/23/15 3:00 AM	0.717	10.3	69.2	103.0	182.93	103043	868	S5-5
5/23/15 4:00 AM	0.908	9.4	70.4	104.1	179.80	104141	833	S5-5
5/23/15 5:00 AM	0.498	8.5	70.3	104.9	184.95	104862	780	S5-5
5/23/15 6:00 AM	0.549	10.1	65.5	104.8	190.70	104808	810	S5-5
5/22/15 8:00 PM	1.172	18.0	57.6	97.4	208.10	97410	1186	S5-2
5/22/15 9:00 PM	0.782	16.7	67.5	98.8	202.70	98811	1283	S5-2
5/22/15 10:00 PM	0.809	16.3	64.4	99.4	181.24	99360	1194	S5-2
5/22/15 11:00 PM	0.739	14.9	67.8	100.3	198.97	100300	1147	S5-2
5/23/15 12:00 AM	0.523	13.0	73.9	100.9	244.16	100852	1103	S5-2
5/23/15 1:00 AM	0.538	11.9	73.7	101.4	238.13	101386	1028	S5-2
5/23/15 2:00 AM	1.190	11.7	67.3	102.2	225.28	102164	928	S5-2
5/23/15 3:00 AM	1.756	10.3	69.2	103.0	244.07	103043	868	S5-2
5/23/15 4:00 AM	1.989	9.4	70.4	104.1	249.41	104141	833	S5-2
5/23/15 5:00 AM	1.250	8.5	70.3	104.9	205.30	104862	780	S5-2
5/23/15 6:00 AM	0.870	10.1	65.5	104.8	161.94	104808	810	S5-2
5/22/15 8:00 PM	1.567	18.0	57.6	97.4	220.09	97410	1186	S5-3
5/22/15 9:00 PM	1.212	16.7	67.5	98.8	216.04	98811	1283	S5-3
5/22/15 10:00 PM	0.946	16.3	64.4	99.4	195.88	99360	1194	S5-3
5/22/15 11:00 PM	1.210	14.9	67.8	100.3	211.79	100300	1147	S5-3
5/23/15 12:00 AM	1.733	13.0	73.9	100.9	243.26	100852	1103	S5-3
5/23/15 1:00 AM	1.918	11.9	73.7	101.4	243.92	101386	1028	S5-3
5/23/15 2:00 AM	1.831	11.7	67.3	102.2	236.52	102164	928	S5-3
5/23/15 3:00 AM	2.542	10.3	69.2	103.0	241.16	103043	868	S5-3
5/23/15 4:00 AM	3.031	9.4	70.4	104.1	235.38	104141	833	S5-3
5/23/15 5:00 AM	2.109	8.5	70.3	104.9	220.87	104862	780	S5-3
5/23/15 6:00 AM	1.499	10.1	65.5	104.8	155.88	104808	810	S5-3
5/22/15 8:00 PM	1.969	18.0	57.6	97.4	209.61	97410	1186	S5-4
5/22/15 9:00 PM	1.603	16.7	67.5	98.8	206.05	98811	1283	S5-4
5/22/15 10:00 PM	1.212	16.3	64.4	99.4	205.04	99360	1194	S5-4
5/22/15 11:00 PM	1.470	14.9	67.8	100.3	208.81	100300	1147	S5-4
5/23/15 12:00 AM	2.299	13.0	73.9	100.9	230.79	100852	1103	S5-4
5/23/15 1:00 AM	2.646	11.9	73.7	101.4	236.55	101386	1028	S5-4
5/23/15 2:00 AM	2.324	11.7	67.3	102.2	240.09	102164	928	S5-4
5/23/15 3:00 AM	2.966	10.3	69.2	103.0	242.92	103043	868	S5-4
5/23/15 4:00 AM	3.630	9.4	70.4	104.1	245.17	104141	833	S5-4

5/23/15 5:00 AM	2.776	8.5	70.3	104.9	239.55	104862	780	S5-4
5/23/15 6:00 AM	2.132	10.1	65.5	104.8	165.33	104808	810	S5-4
5/22/15 8:00 PM		18.2	58.3	99.3		99313	1223	S6
5/22/15 9:00 PM		16.7	61.7	99.9		99857	1171	S6
5/22/15 10:00 PM		16.3	65.8	99.8		99810	1220	S6
5/22/15 11:00 PM		15.0	70.4	100.6		100612	1200	S6
5/23/15 12:00 AM		14.3	71.6	101.3		101321	1163	S6
5/23/15 1:00 AM		14.0	66.8	102.4		102372	1071	S6
5/23/15 2:00 AM		11.8	70.2	103.2		103159	976	S6
5/23/15 3:00 AM		10.4	68.0	103.7		103662	857	S6
5/23/15 4:00 AM		9.9	62.1	104.5		104541	756	S6
5/23/15 5:00 AM		8.8	66.6	105.2		105246	755	S6
5/23/15 6:00 AM		10.6	62.4	104.2		104207	798	S6
5/22/15 8:00 PM								S7
5/22/15 9:00 PM								S7
5/22/15 10:00 PM								S7
5/22/15 11:00 PM								S7
5/23/15 12:00 AM								S7
5/23/15 1:00 AM								S7
5/23/15 2:00 AM								S7
5/23/15 3:00 AM								S7
5/23/15 4:00 AM								S7
5/23/15 5:00 AM								S7
5/23/15 6:00 AM								S7

DE09

t	WS	T	RH	P	WD	p.air	p,wv	sample point	
date	[m/s]	[C]	[%]	[KPa]	[deg]	[Pa]	[Pa]		
5/23/15 7:50 AM	2.075	13.6	66.3	104.5	187.55	104451	1028	S1-5	
5/23/15 8:50 AM	2.560	16.0	54.5	102.7	189.71	102703	992	S1-5	
5/23/15 9:50 AM	1.808	17.6	48.9	101.6	188.03	101611	987	S1-5	
5/23/15 10:50 AM	1.573	19.0	47.1	100.3	181.78	100291	1037	S1-5	
5/23/15 11:50 AM	1.511	19.8	44.1	98.8	182.68	98796	1018	S1-5	
5/23/15 12:50 PM	1.651	20.5	47.5	97.8	174.55	97790	1148	S1-5	
5/23/15 1:50 PM	1.511	21.3	46.9	97.2	176.84	97232	1188	S1-5	
5/23/15 2:50 PM	1.861	21.7	48.2	97.0	171.81	96981	1248	S1-5	
5/23/15 3:50 PM	1.859	21.3	48.4	97.1	175.20	97106	1227	S1-5	
5/23/15 7:50 AM	0.268	13.6	66.3	104.5	41.18	104451	1028	S1-2	
5/23/15 8:50 AM	0.268	16.0	54.5	102.7	40.75	102703	992	S1-2	
5/23/15 9:50 AM	0.268	17.6	48.9	101.6	41.04	101611	987	S1-2	
5/23/15 10:50 AM	0.268	19.0	47.1	100.3	41.13	100291	1037	S1-2	
5/23/15 11:50 AM	0.268	19.8	44.1	98.8	40.83	98796	1018	S1-2	
5/23/15 12:50 PM	0.268	20.5	47.5	97.8	40.63	97790	1148	S1-2	
5/23/15 1:50 PM	0.268	21.3	46.9	97.2	40.65	97232	1188	S1-2	
5/23/15 2:50 PM	0.268	21.7	48.2	97.0	40.69	96981	1248	S1-2	
5/23/15 3:50 PM	0.268	21.3	48.4	97.1	40.97	97106	1227	S1-2	
5/23/15 7:50 AM	3.274	13.6	66.3	104.5	193.91	104451	1028	S1-3	
5/23/15 8:50 AM	4.159	16.0	54.5	102.7	157.22	102703	992	S1-3	
5/23/15 9:50 AM	3.100	17.6	48.9	101.6	183.79	101611	987	S1-3	
5/23/15 10:50 AM	2.552	19.0	47.1	100.3	198.91	100291	1037	S1-3	
5/23/15 11:50 AM	1.968	19.8	44.1	98.8	206.12	98796	1018	S1-3	
5/23/15 12:50 PM	2.012	20.5	47.5	97.8	218.30	97790	1148	S1-3	
5/23/15 1:50 PM	2.436	21.3	46.9	97.2	215.52	97232	1188	S1-3	
5/23/15 2:50 PM	2.524	21.7	48.2	97.0	222.97	96981	1248	S1-3	
5/23/15 3:50 PM	2.321	21.3	48.4	97.1	221.13	97106	1227	S1-3	
5/23/15 7:50 AM	0.268	13.6	66.3	104.5	180.30	104451	1028	S1-4	
5/23/15 8:50 AM	0.268	16.0	54.5	102.7	180.30	102703	992	S1-4	

5/23/15 9:50 AM	0.268	17.6	48.9	101.6	180.26	101611	987	S1-4
5/23/15 10:50 AM	0.268	19.0	47.1	100.3	180.30	100291	1037	S1-4
5/23/15 11:50 AM	0.268	19.8	44.1	98.8	180.30	98796	1018	S1-4
5/23/15 12:50 PM	0.268	20.5	47.5	97.8	180.30	97790	1148	S1-4
5/23/15 1:50 PM	0.268	21.3	46.9	97.2	180.30	97232	1188	S1-4
5/23/15 2:50 PM	0.268	21.7	48.2	97.0	180.30	96981	1248	S1-4
5/23/15 3:50 PM	0.268	21.3	48.4	97.1	180.30	97106	1227	S1-4
5/23/15 7:50 AM	3.213	16.2	74.0	103.2	141.89	103232	1358	S2-5
5/23/15 8:50 AM	3.249	18.8	54.6	100.8	147.99	100789	1184	S2-5
5/23/15 9:50 AM	2.842	20.7	49.3	98.8	150.22	98840	1202	S2-5
5/23/15 10:50 AM	2.484	21.8	46.1	97.0	164.11	96988	1205	S2-5
5/23/15 11:50 AM	2.303	21.8	45.4	95.6	160.12	95569	1185	S2-5
5/23/15 12:50 PM	1.994	22.4	47.1	94.5	173.53	94500	1278	S2-5
5/23/15 1:50 PM	2.297	23.2	47.5	93.8	179.06	93806	1349	S2-5
5/23/15 2:50 PM	1.985	23.2	47.2	93.5	187.02	93457	1341	S2-5
5/23/15 3:50 PM	2.049	23.1	46.7	93.7	176.88	93694	1322	S2-5
5/23/15 7:50 AM		15.7	58.1	102.4		102381	1031	S2-1R
5/23/15 8:50 AM		18.0	42.8	100.7		100663	883	S2-1R
5/23/15 9:50 AM		19.3	39.3	99.6		99558	883	S2-1R
5/23/15 10:50 AM		19.5	39.6	98.3		98270	901	S2-1R
5/23/15 11:50 AM		21.2	39.4	98.1		98068	993	S2-1R
5/23/15 12:50 PM		23.3	39.1	98.1		98104	1118	S2-1R
5/23/15 1:50 PM		24.1	38.5	97.5		97546	1159	S2-1R
5/23/15 2:50 PM		25.4	39.6	95.6		95589	1287	S2-1R
5/23/15 3:50 PM		25.2	39.5	95.3		95255	1271	S2-1R
5/23/15 7:50 AM	2.710	16.2	74.0	103.2	213.94	103232	1358	S2-2
5/23/15 8:50 AM	3.379	18.8	54.6	100.8	185.65	100789	1184	S2-2
5/23/15 9:50 AM	2.804	20.7	49.3	98.8	209.94	98840	1202	S2-2
5/23/15 10:50 AM	2.339	21.8	46.1	97.0	219.42	96988	1205	S2-2
5/23/15 11:50 AM	2.043	21.8	45.4	95.6	217.04	95569	1185	S2-2
5/23/15 12:50 PM	1.806	22.4	47.1	94.5	214.87	94500	1278	S2-2
5/23/15 1:50 PM	2.077	23.2	47.5	93.8	216.21	93806	1349	S2-2
5/23/15 2:50 PM	2.002	23.2	47.2	93.5	219.68	93457	1341	S2-2
5/23/15 3:50 PM	1.894	23.1	46.7	93.7	216.10	93694	1322	S2-2
5/23/15 7:50 AM	2.980	16.2	74.0	103.2	194.34	103232	1358	S2-3
5/23/15 8:50 AM	3.894	18.8	54.6	100.8	147.19	100789	1184	S2-3
5/23/15 9:50 AM	2.965	20.7	49.3	98.8	169.47	98840	1202	S2-3
5/23/15 10:50 AM	2.384	21.8	46.1	97.0	189.90	96988	1205	S2-3
5/23/15 11:50 AM	1.798	21.8	45.4	95.6	199.72	95569	1185	S2-3
5/23/15 12:50 PM	1.734	22.4	47.1	94.5	210.77	94500	1278	S2-3
5/23/15 1:50 PM	2.109	23.2	47.5	93.8	213.46	93806	1349	S2-3
5/23/15 2:50 PM	2.119	23.2	47.2	93.5	216.87	93457	1341	S2-3
5/23/15 3:50 PM	1.867	23.1	46.7	93.7	207.88	93694	1322	S2-3
5/23/15 7:50 AM	3.489	16.2	74.0	103.2	207.86	103232	1358	S2-4
5/23/15 8:50 AM	4.522	18.8	54.6	100.8	160.80	100789	1184	S2-4
5/23/15 9:50 AM	3.277	20.7	49.3	98.8	183.58	98840	1202	S2-4
5/23/15 10:50 AM	2.563	21.8	46.1	97.0	202.03	96988	1205	S2-4
5/23/15 11:50 AM	1.851	21.8	45.4	95.6	203.91	95569	1185	S2-4
5/23/15 12:50 PM	1.883	22.4	47.1	94.5	221.33	94500	1278	S2-4
5/23/15 1:50 PM	2.338	23.2	47.5	93.8	219.29	93806	1349	S2-4
5/23/15 2:50 PM	2.411	23.2	47.2	93.5	227.44	93457	1341	S2-4
5/23/15 3:50 PM	2.130	23.1	46.7	93.7	212.74	93694	1322	S2-4
5/23/15 7:50 AM		14.9	66.2	101.6		101594	1123	S3
5/23/15 8:50 AM		17.1	48.0	100.5		100523	937	S3
5/23/15 9:50 AM		19.3	41.8	99.8		99816	938	S3
5/23/15 10:50 AM		21.2	37.6	99.5		99501	950	S3

5/23/15 11:50 AM		22.9	37.6	97.1		97071	1052	S3
5/23/15 12:50 PM		24.3	37.2	95.7		95739	1129	S3
5/23/15 1:50 PM		25.0	37.0	95.1		95075	1176	S3
5/23/15 2:50 PM		25.8	37.5	94.7		94717	1246	S3
5/23/15 3:50 PM		25.8	37.4	94.5		94513	1240	S3
5/23/15 7:50 AM		15.3	61.9	102.7		102662	1078	S4
5/23/15 8:50 AM		17.5	44.7	101.1		101096	892	S4
5/23/15 9:50 AM		19.4	39.6	99.8		99780	893	S4
5/23/15 10:50 AM		20.8	37.5	98.4		98353	923	S4
5/23/15 11:50 AM		22.5	37.7	97.1		97131	1027	S4
5/23/15 12:50 PM		23.7	36.9	96.1		96115	1079	S4
5/23/15 1:50 PM		24.0	36.1	96.4		96431	1077	S4
5/23/15 2:50 PM		24.6	36.5	95.9		95852	1131	S4
5/23/15 3:50 PM		24.3	36.7	95.7		95672	1115	S4
5/23/15 7:50 AM	1.321	16.9	51.5	100.7	192.26	100654	992	S5-5
5/23/15 8:50 AM	2.268	18.4	40.8	98.4	196.76	98386	867	S5-5
5/23/15 9:50 AM	1.614	20.6	41.1	96.3	193.69	96281	999	S5-5
5/23/15 10:50 AM	0.976	22.6	42.1	94.1	192.31	94106	1156	S5-5
5/23/15 11:50 AM	1.082	23.6	43.3	92.1	173.39	92140	1265	S5-5
5/23/15 12:50 PM	0.743	23.3	41.4	90.5	175.11	90546	1182	S5-5
5/23/15 1:50 PM	1.428	22.6	41.2	90.2	181.41	90230	1131	S5-5
5/23/15 2:50 PM	0.824	23.5	40.1	89.9	174.41	89925	1159	S5-5
5/23/15 3:50 PM	0.660	23.1	40.7	90.5	174.63	90462	1151	S5-5
5/23/15 7:50 AM	2.071	16.9	51.5	100.7	158.72	100654	992	S5-2
5/23/15 8:50 AM	3.040	18.4	40.8	98.4	125.02	98386	867	S5-2
5/23/15 9:50 AM	2.370	20.6	41.1	96.3	155.12	96281	999	S5-2
5/23/15 10:50 AM	1.957	22.6	42.1	94.1	182.06	94106	1156	S5-2
5/23/15 11:50 AM	1.537	23.6	43.3	92.1	189.06	92140	1265	S5-2
5/23/15 12:50 PM	1.370	23.3	41.4	90.5	206.24	90546	1182	S5-2
5/23/15 1:50 PM	1.694	22.6	41.2	90.2	195.41	90230	1131	S5-2
5/23/15 2:50 PM	1.438	23.5	40.1	89.9	207.29	89925	1159	S5-2
5/23/15 3:50 PM	1.376	23.1	40.7	90.5	206.82	90462	1151	S5-2
5/23/15 7:50 AM	2.768	16.9	51.5	100.7	136.79	100654	992	S5-3
5/23/15 8:50 AM	3.873	18.4	40.8	98.4	126.13	98386	867	S5-3
5/23/15 9:50 AM	2.932	20.6	41.1	96.3	148.92	96281	999	S5-3
5/23/15 10:50 AM	2.363	22.6	42.1	94.1	177.80	94106	1156	S5-3
5/23/15 11:50 AM	1.833	23.6	43.3	92.1	177.20	92140	1265	S5-3
5/23/15 12:50 PM	1.853	23.3	41.4	90.5	212.34	90546	1182	S5-3
5/23/15 1:50 PM	2.152	22.6	41.2	90.2	203.82	90230	1131	S5-3
5/23/15 2:50 PM	2.135	23.5	40.1	89.9	213.43	89925	1159	S5-3
5/23/15 3:50 PM	2.075	23.1	40.7	90.5	213.73	90462	1151	S5-3
5/23/15 7:50 AM	3.284	16.9	51.5	100.7	142.51	100654	992	S5-4
5/23/15 8:50 AM	4.431	18.4	40.8	98.4	129.52	98386	867	S5-4
5/23/15 9:50 AM	3.277	20.6	41.1	96.3	166.43	96281	999	S5-4
5/23/15 10:50 AM	2.542	22.6	42.1	94.1	179.87	94106	1156	S5-4
5/23/15 11:50 AM	1.911	23.6	43.3	92.1	183.88	92140	1265	S5-4
5/23/15 12:50 PM	1.979	23.3	41.4	90.5	213.42	90546	1182	S5-4
5/23/15 1:50 PM	2.347	22.6	41.2	90.2	200.81	90230	1131	S5-4
5/23/15 2:50 PM	2.460	23.5	40.1	89.9	211.35	89925	1159	S5-4
5/23/15 3:50 PM	2.387	23.1	40.7	90.5	215.35	90462	1151	S5-4
5/23/15 7:50 AM		18.5	47.5	98.0		98007	1010	S6
5/23/15 8:50 AM		19.7	40.4	97.4		97362	927	S6
5/23/15 9:50 AM		21.3	35.6	96.7		96689	900	S6
5/23/15 10:50 AM		21.9	33.9	96.6		96565	893	S6
5/23/15 11:50 AM		24.7	32.7	95.7		95708	1021	S6
5/23/15 12:50 PM		24.4	32.4	94.8		94773	991	S6

5/23/15 1:50 PM			23.2	33.0	94.1		94057	941	S6
5/23/15 2:50 PM			20.9	38.6	96.4		96385	954	S6
5/23/15 3:50 PM			20.4	38.2	98.8		98825	916	S6
5/22/15 4:50 PM									S6
5/23/15 7:50 AM									S7
5/23/15 8:50 AM									S7
5/23/15 9:50 AM									S7
5/23/15 10:50 AM									S7
5/23/15 11:50 AM									S7
5/23/15 12:50 PM									S7
5/23/15 1:50 PM									S7
5/23/15 2:50 PM									S7
5/23/15 3:50 PM									S7

DE10

t	WS	T	RH	P	WD	p.air	p,wv	sample point	
date	[m/s]	[C]	[%]	[KPa]	[deg]	[Pa]	[Pa]		
5/24/15 8:05 AM	2.304	17.4	73.8	102.2	192.94	102232	1471	S1-5	
5/24/15 9:05 AM	2.637	20.3	66.9	99.9	192.53	99949	1593	S1-5	
5/24/15 10:05 AM	3.027	22.6	64.1	97.9	191.49	97944	1755	S1-5	
5/24/15 11:05 AM	2.721	24.0	61.1	96.0	184.05	95984	1823	S1-5	
5/24/15 12:05 PM	2.448	24.9	58.2	94.8	179.95	94824	1838	S1-5	
5/24/15 1:05 PM	2.850	26.0	57.7	94.0	175.55	93985	1940	S1-5	
5/24/15 8:05 AM	0.268	17.4	73.8	102.2	42.11	102232	1471	S1-2	
5/24/15 9:05 AM	0.268	20.3	66.9	99.9	41.15	99949	1593	S1-2	
5/24/15 10:05 AM	0.268	22.6	64.1	97.9	40.66	97944	1755	S1-2	
5/24/15 11:05 AM	0.268	24.0	61.1	96.0	40.62	95984	1823	S1-2	
5/24/15 12:05 PM	0.268	24.9	58.2	94.8	41.13	94824	1838	S1-2	
5/24/15 1:05 PM	0.268	26.0	57.7	94.0	39.72	93985	1940	S1-2	
5/24/15 8:05 AM	2.590	17.4	73.8	102.2	183.46	102232	1471	S1-3	
5/24/15 9:05 AM	3.362	20.3	66.9	99.9	188.36	99949	1593	S1-3	
5/24/15 10:05 AM	3.549	22.6	64.1	97.9	188.95	97944	1755	S1-3	
5/24/15 11:05 AM	3.273	24.0	61.1	96.0	197.71	95984	1823	S1-3	
5/24/15 12:05 PM	2.926	24.9	58.2	94.8	198.72	94824	1838	S1-3	
5/24/15 1:05 PM	3.504	26.0	57.7	94.0	208.45	93985	1940	S1-3	
5/24/15 8:05 AM	0.268	17.4	73.8	102.2	180.30	102232	1471	S1-4	
5/24/15 9:05 AM	0.268	20.3	66.9	99.9	180.29	99949	1593	S1-4	
5/24/15 10:05 AM	0.268	22.6	64.1	97.9	180.29	97944	1755	S1-4	
5/24/15 11:05 AM	0.268	24.0	61.1	96.0	180.29	95984	1823	S1-4	
5/24/15 12:05 PM	0.268	24.9	58.2	94.8	180.30	94824	1838	S1-4	
5/24/15 1:05 PM	0.268	26.0	57.7	94.0	180.30	93985	1940	S1-4	
5/24/15 8:05 AM	1.986	18.0	88.1	101.6	189.06	101634	1818	S2-5	
5/24/15 9:05 AM	2.414	21.9	74.4	98.0	189.54	98028	1952	S2-5	
5/24/15 10:05 AM	2.560	24.1	69.0	94.8	185.64	94844	2067	S2-5	
5/24/15 11:05 AM	2.279	25.3	64.6	92.7	192.70	92663	2080	S2-5	
5/24/15 12:05 PM	2.071	26.2	60.6	91.1	194.99	91107	2059	S2-5	
5/24/15 1:05 PM	2.220	26.7	61.0	90.2	204.08	90243	2137	S2-5	
	2.032	27.1	60.3	89.9	202.78	89901	2166		
5/24/15 8:05 AM			18.3	64.7	100.3		100338	1363	S2-1R
5/24/15 9:05 AM			21.9	55.9	97.5		97472	1470	S2-1R
5/24/15 10:05 AM			23.8	53.0	95.5		95453	1560	S2-1R
5/24/15 11:05 AM			24.7	50.7	94.4		94357	1578	S2-1R
5/24/15 12:05 PM			26.7	47.3	93.9		93932	1655	S2-1R
5/24/15 1:05 PM			27.9	47.3	94.7		94657	1778	S2-1R
5/24/15 8:05 AM	2.590	18.0	88.1	101.6	217.68	101634	1818	S2-2	
5/24/15 9:05 AM	2.989	21.9	74.4	98.0	220.42	98028	1952	S2-2	

5/24/15 10:05 AM	3.098	24.1	69.0	94.8	220.88	94844	2067	S2-2
5/24/15 11:05 AM	2.796	25.3	64.6	92.7	221.77	92663	2080	S2-2
5/24/15 12:05 PM	2.516	26.2	60.6	91.1	222.76	91107	2059	S2-2
5/24/15 1:05 PM	2.764	26.7	61.0	90.2	220.15	90243	2137	S2-2
5/24/15 8:05 AM	3.201	18.0	88.1	101.6	195.75	101634	1818	S2-3
5/24/15 9:05 AM	3.584	21.9	74.4	98.0	195.89	98028	1952	S2-3
5/24/15 10:05 AM	3.642	24.1	69.0	94.8	192.43	94844	2067	S2-3
5/24/15 11:05 AM	3.365	25.3	64.6	92.7	200.07	92663	2080	S2-3
5/24/15 12:05 PM	2.991	26.2	60.6	91.1	202.73	91107	2059	S2-3
5/24/15 1:05 PM	3.399	26.7	61.0	90.2	209.89	90243	2137	S2-3
5/24/15 8:05 AM	3.625	18.0	88.1	101.6	192.86	101634	1818	S2-4
5/24/15 9:05 AM	4.003	21.9	74.4	98.0	192.72	98028	1952	S2-4
5/24/15 10:05 AM	4.006	24.1	69.0	94.8	189.05	94844	2067	S2-4
5/24/15 11:05 AM	3.758	25.3	64.6	92.7	196.29	92663	2080	S2-4
5/24/15 12:05 PM	3.389	26.2	60.6	91.1	197.75	91107	2059	S2-4
5/24/15 1:05 PM	3.904	26.7	61.0	90.2	205.07	90243	2137	S2-4
5/24/15 8:05 AM		18.2	66.1	100.4		100392	1376	S3
5/24/15 9:05 AM		21.6	61.8	97.3		97267	1594	S3
5/24/15 10:05 AM		24.2	65.8	96.0		95955	1993	S3
5/24/15 11:05 AM		26.3	54.6	95.1		95114	1859	S3
5/24/15 12:05 PM		27.9	45.8	93.3		93331	1729	S3
5/24/15 1:05 PM		28.6	45.3	92.6		92619	1770	S3
5/24/15 8:05 AM		17.7	67.0	101.3		101317	1354	S4
5/24/15 9:05 AM		21.3	61.0	97.8		97816	1551	S4
5/24/15 10:05 AM		23.5	61.3	95.5		95537	1781	S4
5/24/15 11:05 AM		25.4	52.7	94.3		94290	1708	S4
5/24/15 12:05 PM		27.0	45.7	93.5		93452	1628	S4
5/24/15 1:05 PM		27.5	46.1	93.1		93052	1698	S4
5/24/15 8:05 AM	2.535	18.1	66.0	101.2	128.05	101171	1370	S5-5
5/24/15 9:05 AM	2.948	22.2	60.4	97.5	130.50	97477	1618	S5-5
5/24/15 10:05 AM	3.346	25.1	53.6	94.2	130.26	94202	1711	S5-5
5/24/15 11:05 AM	2.962	27.2	50.4	91.9	134.14	91912	1812	S5-5
5/24/15 12:05 PM	2.642	28.2	48.7	90.0	137.66	90039	1862	S5-5
5/24/15 1:05 PM	2.785	27.8	49.2	89.1	141.64	89150	1838	S5-5
5/24/15 8:05 AM	3.124	18.1	66.0	101.2	200.77	101171	1370	S5-2
5/24/15 9:05 AM	3.538	22.2	60.4	97.5	201.87	97477	1618	S5-2
5/24/15 10:05 AM	3.572	25.1	53.6	94.2	199.98	94202	1711	S5-2
5/24/15 11:05 AM	3.372	27.2	50.4	91.9	207.14	91912	1812	S5-2
5/24/15 12:05 PM	3.150	28.2	48.7	90.0	209.32	90039	1862	S5-2
5/24/15 1:05 PM	3.257	27.8	49.2	89.1	213.03	89150	1838	S5-2
5/24/15 8:05 AM	3.563	18.1	66.0	101.2	201.62	101171	1370	S5-3
5/24/15 9:05 AM	3.989	22.2	60.4	97.5	201.14	97477	1618	S5-3
5/24/15 10:05 AM	3.970	25.1	53.6	94.2	198.11	94202	1711	S5-3
5/24/15 11:05 AM	3.801	27.2	50.4	91.9	203.81	91912	1812	S5-3
5/24/15 12:05 PM	3.544	28.2	48.7	90.0	204.34	90039	1862	S5-3
5/24/15 1:05 PM	3.778	27.8	49.2	89.1	211.70	89150	1838	S5-3
5/24/15 8:05 AM	3.804	18.1	66.0	101.2	196.88	101171	1370	S5-4
5/24/15 9:05 AM	4.208	22.2	60.4	97.5	194.69	97477	1618	S5-4
5/24/15 10:05 AM	4.190	25.1	53.6	94.2	193.22	94202	1711	S5-4
5/24/15 11:05 AM	4.005	27.2	50.4	91.9	199.80	91912	1812	S5-4
5/24/15 12:05 PM	3.760	28.2	48.7	90.0	201.16	90039	1862	S5-4
5/24/15 1:05 PM	4.124	27.8	49.2	89.1	207.13	89150	1838	S5-4
5/24/15 8:05 AM		19.0	62.6	99.4		99358	1373	S6

5/24/15 9:05 AM	23.1	56.7	95.8		95796	1606	S6
5/24/15 10:05 AM	24.8	56.2	93.9		93861	1766	S6
5/24/15 11:05 AM	26.4	50.1	94.0		93951	1718	S6
5/24/15 12:05 PM	28.5	44.2	92.6		92588	1720	S6
5/24/15 1:05 PM	28.3	45.1	92.2		92219	1736	S6
5/24/15 8:05 AM							S7
5/24/15 9:05 AM							S7
5/24/15 10:05 AM							S7
5/24/15 11:05 AM							S7
5/24/15 12:05 PM							S7
5/24/15 1:05 PM							S7

Appendix B - Tables of derived data

DE01

t	d.rhove.w.v	H	ustar	sample point
date	[g/m^3]	[W/m^2]	[m/s]	
5/17/15 11:00 PM	15.9	-151.09	0.0693	S1-5
5/18/15 12:00 AM	16.1	-172.74	0.0860	S1-5
5/18/15 1:00 AM	16.0	-164.80	0.0726	S1-5
5/18/15 2:00 AM	15.6	-156.55	0.0779	S1-5
5/18/15 3:00 AM	15.6	-116.15	0.0496	S1-5
5/18/15 4:00 AM	15.8	-79.89	0.0459	S1-5
5/18/15 5:00 AM	16.1	-36.03	0.0371	S1-5
5/18/15 6:00 AM	16.2	6.28	0.1172	S1-5
5/17/15 11:00 PM	15.9	-159.08	0.0693	S1-2
5/18/15 12:00 AM	16.1	-183.38	0.0874	S1-2
5/18/15 1:00 AM	16.0	-153.81	0.0461	S1-2
5/18/15 2:00 AM	15.6	-127.40	0.0257	S1-2
5/18/15 3:00 AM	15.6	-122.93	0.0521	S1-2
5/18/15 4:00 AM	15.8	-88.70	0.0577	S1-2
5/18/15 5:00 AM	16.1	-34.62	0.0259	S1-2
5/18/15 6:00 AM	16.2	7.78	0.0634	S1-2
5/17/15 11:00 PM	15.9	-169.68	0.0783	S1-3
5/18/15 12:00 AM	16.1	-193.66	0.0946	S1-3
5/18/15 1:00 AM	16.0	-168.03	0.0589	S1-3
5/18/15 2:00 AM	15.6	-153.93	0.0554	S1-3
5/18/15 3:00 AM	15.6	-148.70	0.0919	S1-3
5/18/15 4:00 AM	15.8	-110.35	0.1062	S1-3
5/18/15 5:00 AM	16.1	-37.43	0.0327	S1-3
5/18/15 6:00 AM	16.2	7.63	0.0638	S1-3
5/17/15 11:00 PM	15.9	-123.53	0.0191	S1-4
5/18/15 12:00 AM	16.1	-133.19	0.0191	S1-4
5/18/15 1:00 AM	16.0	-133.39	0.0191	S1-4
5/18/15 2:00 AM	15.6	-124.50	0.0191	S1-4
5/18/15 3:00 AM	15.6	-103.33	0.0191	S1-4
5/18/15 4:00 AM	15.8	-71.93	0.0191	S1-4
5/18/15 5:00 AM	16.1	-33.56	0.0191	S1-4
5/18/15 6:00 AM	16.2	8.04	0.1166	S1-4
5/17/15 11:00 PM	20.1	-204.25	0.2655	S2-5
5/18/15 12:00 AM	20.1	-218.08	0.2479	S2-5
5/18/15 1:00 AM	19.6	-224.50	0.2647	S2-5
5/18/15 2:00 AM	18.6	-205.36	0.2462	S2-5
5/18/15 3:00 AM	18.7	-173.26	0.3027	S2-5
5/18/15 4:00 AM	18.7	-119.32	0.3400	S2-5
5/18/15 5:00 AM	19.0	-51.96	0.3800	S2-5
5/18/15 6:00 AM	19.1	22.08	0.3284	S2-5
5/17/15 11:00 PM	16.4			S2-1R
5/18/15 12:00 AM	16.5			S2-1R
5/18/15 1:00 AM	16.7			S2-1R
5/18/15 2:00 AM	16.5			S2-1R
5/18/15 3:00 AM	16.7			S2-1R
5/18/15 4:00 AM	16.9			S2-1R
5/18/15 5:00 AM	17.2			S2-1R
5/18/15 6:00 AM	17.3			S2-1R
5/17/15 11:00 PM	20.1	-173.65	0.1297	S2-2
5/18/15 12:00 AM	20.1	-197.93	0.1501	S2-2

5/18/15 1:00 AM	19.6	-194.22	0.1361	S2-2
5/18/15 2:00 AM	18.6	-189.20	0.1548	S2-2
5/18/15 3:00 AM	18.7	-151.98	0.1468	S2-2
5/18/15 4:00 AM	18.7	-106.51	0.1590	S2-2
5/18/15 5:00 AM	19.0	-42.41	0.1228	S2-2
5/18/15 6:00 AM	19.1	20.36	0.2095	S2-2
5/17/15 11:00 PM	20.1	-153.27	0.0771	S2-3
5/18/15 12:00 AM	20.1	-172.98	0.0870	S2-3
5/18/15 1:00 AM	19.6	-159.04	0.0610	S2-3
5/18/15 2:00 AM	18.6	-150.18	0.0616	S2-3
5/18/15 3:00 AM	18.7	-123.65	0.0638	S2-3
5/18/15 4:00 AM	18.7	-88.00	0.0741	S2-3
5/18/15 5:00 AM	19.0	-36.36	0.0642	S2-3
5/18/15 6:00 AM	19.1	14.51	0.0805	S2-3
5/17/15 11:00 PM	20.1	-169.55	0.1028	S2-4
5/18/15 12:00 AM	20.1	-191.32	0.1152	S2-4
5/18/15 1:00 AM	19.6	-161.89	0.0616	S2-4
5/18/15 2:00 AM	18.6	-150.49	0.0585	S2-4
5/18/15 3:00 AM	18.7	-134.27	0.0819	S2-4
5/18/15 4:00 AM	18.7	-96.24	0.0964	S2-4
5/18/15 5:00 AM	19.0	-40.02	0.0862	S2-4
5/18/15 6:00 AM	19.1	15.50	0.0920	S2-4
5/17/15 11:00 PM	17.9			S3
5/18/15 12:00 AM	18.0			S3
5/18/15 1:00 AM	18.6			S3
5/18/15 2:00 AM	18.7			S3
5/18/15 3:00 AM	18.4			S3
5/18/15 4:00 AM	18.4			S3
5/18/15 5:00 AM	18.5			S3
5/18/15 6:00 AM	19.1			S3
5/17/15 11:00 PM	16.9			S4
5/18/15 12:00 AM	17.3			S4
5/18/15 1:00 AM	17.7			S4
5/18/15 2:00 AM	17.7			S4
5/18/15 3:00 AM	18.6			S4
5/18/15 4:00 AM	18.5			S4
5/18/15 5:00 AM	18.8			S4
5/18/15 6:00 AM	18.5			S4
5/17/15 11:00 PM	15.2	-146.30	0.0566	S5-5
5/18/15 12:00 AM	15.2	-152.98	0.0489	S5-5
5/18/15 1:00 AM	15.3	-173.22	0.0807	S5-5
5/18/15 2:00 AM	15.1	-157.91	0.0733	S5-5
5/18/15 3:00 AM	15.3	-120.86	0.0540	S5-5
5/18/15 4:00 AM	15.3	-80.85	0.0436	S5-5
5/18/15 5:00 AM	15.6	-44.55	0.0804	S5-5
5/18/15 6:00 AM	15.7	8.63	0.1075	S5-5
5/17/15 11:00 PM	15.2	-178.77	0.0958	S5-2
5/18/15 12:00 AM	15.2	-198.90	0.1058	S5-2
5/18/15 1:00 AM	15.3	-198.11	0.1060	S5-2
5/18/15 2:00 AM	15.1	-176.79	0.0919	S5-2
5/18/15 3:00 AM	15.3	-145.90	0.0923	S5-2
5/18/15 4:00 AM	15.3	-98.79	0.0809	S5-2
5/18/15 5:00 AM	15.6	-49.33	0.0918	S5-2
5/18/15 6:00 AM	15.7	8.39	0.1214	S5-2
5/17/15 11:00 PM	15.2	-175.60	0.0823	S5-3

5/18/15 12:00 AM	15.2	-210.48	0.1149	S5-3
5/18/15 1:00 AM	15.3	-195.86	0.0929	S5-3
5/18/15 2:00 AM	15.1	-172.31	0.0764	S5-3
5/18/15 3:00 AM	15.3	-145.84	0.0839	S5-3
5/18/15 4:00 AM	15.3	-104.08	0.0878	S5-3
5/18/15 5:00 AM	15.6	-47.95	0.0767	S5-3
5/18/15 6:00 AM	15.7	8.58	0.0924	S5-3
5/17/15 11:00 PM	15.2	-177.54	0.0804	S5-4
5/18/15 12:00 AM	15.2	-215.39	0.1163	S5-4
5/18/15 1:00 AM	15.3	-183.92	0.0711	S5-4
5/18/15 2:00 AM	15.1	-163.39	0.0595	S5-4
5/18/15 3:00 AM	15.3	-140.94	0.0702	S5-4
5/18/15 4:00 AM	15.3	-107.43	0.0919	S5-4
5/18/15 5:00 AM	15.6	-47.47	0.0701	S5-4
5/18/15 6:00 AM	15.7	8.69	0.0792	S5-4
5/17/15 11:00 PM	15.9			S6
5/18/15 12:00 AM	15.8			S6
5/18/15 1:00 AM	16.1			S6
5/18/15 2:00 AM	15.9			S6
5/18/15 3:00 AM	16.1			S6
5/18/15 4:00 AM	16.3			S6
5/18/15 5:00 AM	16.5			S6
5/18/15 6:00 AM	17.0			S6
5/17/15 11:00 PM				S7
5/18/15 12:00 AM				S7
5/18/15 1:00 AM				S7
5/18/15 2:00 AM				S7
5/18/15 3:00 AM				S7
5/18/15 4:00 AM				S7
5/18/15 5:00 AM				S7
5/18/15 6:00 AM				S7

DE02

t	d.rhove.w.v	H	ustar	sample point
date	[g/m^3]	[W/m^2]	[m/s]	
5/18/15 8:30 PM	17.4	-102.59	0.3150	S1-5
5/18/15 9:30 PM	15.9	-163.80	0.2518	S1-5
5/18/15 10:30 PM	15.5	-207.29	0.2406	S1-5
5/18/15 11:30 PM	15.4	-223.58	0.2020	S1-5
5/19/15 12:30 AM	15.5	-219.06	0.1688	S1-5
5/19/15 1:30 AM	15.8	-216.10	0.1922	S1-5
5/19/15 2:30 AM	15.9	-190.82	0.2007	S1-5
5/19/15 3:30 AM	16.1	-157.97	0.2686	S1-5
5/19/15 4:30 AM	16.0	-95.54	0.2719	S1-5
5/19/15 5:30 AM	16.1	-22.24	0.1473	S1-5
5/19/15 6:30 AM	16.1	41.61	0.2553	S1-5
5/18/15 8:30 PM	17.4	-95.68	0.1786	S1-2
5/18/15 9:30 PM	15.9	-163.45	0.2079	S1-2
5/18/15 10:30 PM	15.5	-196.58	0.1683	S1-2
5/18/15 11:30 PM	15.4	-200.88	0.1182	S1-2
5/19/15 12:30 AM	15.5	-176.60	0.0667	S1-2
5/19/15 1:30 AM	15.8	-201.56	0.1276	S1-2
5/19/15 2:30 AM	15.9	-178.44	0.1342	S1-2
5/19/15 3:30 AM	16.1	-147.12	0.1692	S1-2
5/19/15 4:30 AM	16.0	-93.07	0.1811	S1-2
5/19/15 5:30 AM	16.1	-20.42	0.0937	S1-2
5/19/15 6:30 AM	16.1	42.88	0.2414	S1-2

5/18/15 8:30 PM	17.4	-100.61	0.1880	S1-3
5/18/15 9:30 PM	15.9	-163.06	0.1877	S1-3
5/18/15 10:30 PM	15.5	-196.75	0.1535	S1-3
5/18/15 11:30 PM	15.4	-208.14	0.1208	S1-3
5/19/15 12:30 AM	15.5	-208.55	0.1086	S1-3
5/19/15 1:30 AM	15.8	-207.85	0.1282	S1-3
5/19/15 2:30 AM	15.9	-179.58	0.1246	S1-3
5/19/15 3:30 AM	16.1	-149.32	0.1615	S1-3
5/19/15 4:30 AM	16.0	-90.88	0.1532	S1-3
5/19/15 5:30 AM	16.1	-22.45	0.1058	S1-3
5/19/15 6:30 AM	16.1	46.08	0.2973	S1-3
5/18/15 8:30 PM	17.4	-52.78	0.0191	S1-4
5/18/15 9:30 PM	15.9	-90.97	0.0191	S1-4
5/18/15 10:30 PM	15.5	-119.03	0.0191	S1-4
5/18/15 11:30 PM	15.4	-136.46	0.0191	S1-4
5/19/15 12:30 AM	15.5	-141.26	0.0191	S1-4
5/19/15 1:30 AM	15.8	-133.20	0.0191	S1-4
5/19/15 2:30 AM	15.9	-116.30	0.0191	S1-4
5/19/15 3:30 AM	16.1	-88.59	0.0191	S1-4
5/19/15 4:30 AM	16.0	-53.12	0.0191	S1-4
5/19/15 5:30 AM	16.1	-12.10	0.0191	S1-4
5/19/15 6:30 AM	16.1	31.25	0.0191	S1-4
5/18/15 8:30 PM	19.1	-76.50	0.1647	S2-5
5/18/15 9:30 PM	17.4	-138.20	0.1806	S2-5
5/18/15 10:30 PM	16.9	-161.97	0.1172	S2-5
5/18/15 11:30 PM	16.7	-186.57	0.1186	S2-5
5/19/15 12:30 AM	17.2	-223.01	0.2047	S2-5
5/19/15 1:30 AM	17.3	-181.29	0.1164	S2-5
5/19/15 2:30 AM	17.2	-155.80	0.1126	S2-5
5/19/15 3:30 AM	16.9	-100.96	0.0554	S2-5
5/19/15 4:30 AM	16.9	-58.72	0.0526	S2-5
5/19/15 5:30 AM	17.5	-15.26	0.3270	S2-5
5/19/15 6:30 AM	17.4	58.82	0.3184	S2-5
5/18/15 8:30 PM	17.2			S2-1R
5/18/15 9:30 PM	15.8			S2-1R
5/18/15 10:30 PM	15.7			S2-1R
5/18/15 11:30 PM	15.8			S2-1R
5/19/15 12:30 AM	16.3			S2-1R
5/19/15 1:30 AM	16.4			S2-1R
5/19/15 2:30 AM	16.8			S2-1R
5/19/15 3:30 AM	16.8			S2-1R
5/19/15 4:30 AM	16.8			S2-1R
5/19/15 5:30 AM	17.2			S2-1R
5/19/15 6:30 AM	17.1			S2-1R
5/18/15 8:30 PM	19.1	-66.71	0.0849	S2-2
5/18/15 9:30 PM	17.4	-132.22	0.1285	S2-2
5/18/15 10:30 PM	16.9	-165.50	0.1055	S2-2
5/18/15 11:30 PM	16.7	-185.15	0.0958	S2-2
5/19/15 12:30 AM	17.2	-197.30	0.1101	S2-2
5/19/15 1:30 AM	17.3	-173.90	0.0827	S2-2
5/19/15 2:30 AM	17.2	-155.35	0.0926	S2-2
5/19/15 3:30 AM	16.9	-116.90	0.0861	S2-2
5/19/15 4:30 AM	16.9	-71.83	0.1018	S2-2
5/19/15 5:30 AM	17.5	-13.08	0.1207	S2-2
5/19/15 6:30 AM	17.4	53.44	0.2054	S2-2
5/18/15 8:30 PM	19.1	-81.00	0.1509	S2-3
5/18/15 9:30 PM	17.4	-147.38	0.1713	S2-3

5/18/15 10:30 PM	16.9	-170.09	0.1061	S2-3
5/18/15 11:30 PM	16.7	-183.00	0.0834	S2-3
5/19/15 12:30 AM	17.2	-180.53	0.0718	S2-3
5/19/15 1:30 AM	17.3	-169.94	0.0688	S2-3
5/19/15 2:30 AM	17.2	-150.71	0.0751	S2-3
5/19/15 3:30 AM	16.9	-122.97	0.0947	S2-3
5/19/15 4:30 AM	16.9	-73.62	0.1014	S2-4
5/19/15 5:30 AM	17.5	-10.31	0.0427	S2-5
5/19/15 6:30 AM	17.4	54.21	0.2015	S2-6
5/18/15 8:30 PM	19.1	-86.34	0.1764	S2-4
5/18/15 9:30 PM	17.4	-155.22	0.1944	S2-4
5/18/15 10:30 PM	16.9	-185.15	0.1355	S2-4
5/18/15 11:30 PM	16.7	-199.54	0.1082	S2-4
5/19/15 12:30 AM	17.2	-192.42	0.0862	S2-4
5/19/15 1:30 AM	17.3	-187.38	0.0936	S2-4
5/19/15 2:30 AM	17.2	-162.69	0.0941	S2-4
5/19/15 3:30 AM	16.9	-134.66	0.1238	S2-4
5/19/15 4:30 AM	16.9	-79.33	0.1249	S2-5
5/19/15 5:30 AM	17.5	-11.68	0.0685	S2-6
5/19/15 6:30 AM	17.4	59.05	0.2425	S2-7
5/18/15 8:30 PM	19.3			S3
5/18/15 9:30 PM	17.3			S3
5/18/15 10:30 PM	17.0			S3
5/18/15 11:30 PM	16.9			S3
5/19/15 12:30 AM	17.2			S3
5/19/15 1:30 AM	17.4			S3
5/19/15 2:30 AM	17.2			S3
5/19/15 3:30 AM	17.0			S3
5/19/15 4:30 AM	16.8			S3
5/19/15 5:30 AM	16.9			S3
5/19/15 6:30 AM	16.7			S3
5/18/15 8:30 PM	19.0			S4
5/18/15 9:30 PM	17.3			S4
5/18/15 10:30 PM	16.7			S4
5/18/15 11:30 PM	16.5			S4
5/19/15 12:30 AM	16.9			S4
5/19/15 1:30 AM	17.0			S4
5/19/15 2:30 AM	17.2			S4
5/19/15 3:30 AM	16.8			S4
5/19/15 4:30 AM	16.8			S5
5/19/15 5:30 AM	17.2			S6
5/19/15 6:30 AM	17.7			S7
5/18/15 8:30 PM	16.1	-94.27	0.1917	S5-5
5/18/15 9:30 PM	14.8	-148.26	0.1681	S5-5
5/18/15 10:30 PM	14.4	-176.09	0.1251	S5-5
5/18/15 11:30 PM	14.4	-186.12	0.0953	S5-5
5/19/15 12:30 AM	14.6	-177.09	0.0699	S5-5
5/19/15 1:30 AM	14.9	-170.23	0.0752	S5-5
5/19/15 2:30 AM	15.0	-135.19	0.0504	S5-5
5/19/15 3:30 AM	15.0	-112.60	0.0716	S5-5
5/19/15 4:30 AM	15.0	-69.27	0.0766	S5-5
5/19/15 5:30 AM	14.8	-14.41	0.0462	S5-5
5/19/15 6:30 AM	15.0	41.72	0.1587	S5-5
5/18/15 8:30 PM	16.1	-93.92	0.1576	S5-2
5/18/15 9:30 PM	14.8	-158.52	0.1745	S5-2
5/18/15 10:30 PM	14.4	-181.98	0.1167	S5-2
5/18/15 11:30 PM	14.4	-191.47	0.0882	S5-2

5/19/15 12:30 AM	14.6	-194.71	0.0844	S5-2
5/19/15 1:30 AM	14.9	-182.81	0.0823	S5-2
5/19/15 2:30 AM	15.0	-156.21	0.0770	S5-2
5/19/15 3:30 AM	15.0	-133.74	0.1130	S5-2
5/19/15 4:30 AM	15.0	-81.62	0.1143	S5-2
5/19/15 5:30 AM	14.8	-15.05	0.0448	S5-2
5/19/15 6:30 AM	15.0	45.93	0.1902	S5-2
5/18/15 8:30 PM	16.1	-99.15	0.1692	S5-3
5/18/15 9:30 PM	14.8	-168.33	0.1944	S5-3
5/18/15 10:30 PM	14.4	-193.41	0.1311	S5-3
5/18/15 11:30 PM	14.4	-205.60	0.1037	S5-3
5/19/15 12:30 AM	14.6	-207.21	0.0962	S5-3
5/19/15 1:30 AM	14.9	-200.88	0.1048	S5-3
5/19/15 2:30 AM	15.0	-173.64	0.1023	S5-3
5/19/15 3:30 AM	15.0	-142.37	0.1274	S5-3
5/19/15 4:30 AM	15.0	-86.90	0.1283	S5-3
5/19/15 5:30 AM	14.8	-18.41	0.0754	S5-3
5/19/15 6:30 AM	15.0	50.15	0.2359	S5-3
5/18/15 8:30 PM	16.1	-105.93	0.1959	S5-4
5/18/15 9:30 PM	14.8	-173.24	0.2023	S5-4
5/18/15 10:30 PM	14.4	-201.68	0.1428	S5-4
5/18/15 11:30 PM	14.4	-215.60	0.1155	S5-4
5/19/15 12:30 AM	14.6	-211.28	0.0971	S5-4
5/19/15 1:30 AM	14.9	-206.45	0.1085	S5-4
5/19/15 2:30 AM	15.0	-179.05	0.1072	S5-4
5/19/15 3:30 AM	15.0	-145.81	0.1303	S5-4
5/19/15 4:30 AM	15.0	-89.07	0.1312	S5-4
5/19/15 5:30 AM	14.8	-19.68	0.0855	S5-4
5/19/15 6:30 AM	15.0	52.32	0.2606	S5-4
5/18/15 8:30 PM	16.9			S6
5/18/15 9:30 PM	15.6			S6
5/18/15 10:30 PM	15.3			S6
5/18/15 11:30 PM	15.3			S6
5/19/15 12:30 AM	15.7			S6
5/19/15 1:30 AM	16.0			S6
5/19/15 2:30 AM	16.1			S6
5/19/15 3:30 AM	16.3			S6
5/19/15 4:30 AM	16.4			S6
5/19/15 5:30 AM	16.3			S6
5/19/15 6:30 AM	16.4			S6
5/18/15 8:30 PM				S7
5/18/15 9:30 PM				S7
5/18/15 10:30 PM				S7
5/18/15 11:30 PM				S7
5/19/15 12:30 AM				S7
5/19/15 1:30 AM				S7
5/19/15 2:30 AM				S7
5/19/15 3:30 AM				S7
5/19/15 4:30 AM				S7
5/19/15 5:30 AM				S7
5/19/15 6:30 AM				S7

DE03

t	d.rhove.w.v	H	ustar	sample point
date	[g/m^3]	[W/m^2]	[m/s]	
5/19/15 8:30 AM	16.8	104.09	0.2279	S1-5
5/19/15 9:30 AM	16.9	131.72	0.1751	S1-5
5/19/15 10:30 AM	17.5	147.64	0.1720	S1-5

5/19/15 11:30 AM	18.5	151.55	0.2092	S1-5
5/19/15 12:30 PM	19.4	154.21	0.2854	S1-5
5/19/15 1:30 PM	19.6	142.36	0.2152	S1-5
5/19/15 2:30 PM	20.2	122.65	0.2120	S1-5
5/19/15 3:30 PM	20.0	101.70	0.2845	S1-5
5/19/15 8:30 AM	16.8	104.66	0.2059	S1-2
5/19/15 9:30 AM	16.9	135.58	0.1932	S1-2
5/19/15 10:30 AM	17.5	151.89	0.1903	S1-2
5/19/15 11:30 AM	18.5	158.43	0.2545	S1-2
5/19/15 12:30 PM	19.4	156.52	0.2770	S1-2
5/19/15 1:30 PM	19.6	148.98	0.2779	S1-2
5/19/15 2:30 PM	20.2			S1-2
5/19/15 3:30 PM	20.0			S1-2
5/19/15 8:30 AM	16.8	109.93	0.2873	S1-3
5/19/15 9:30 AM	16.9	139.91	0.2299	S1-3
5/19/15 10:30 AM	17.5	156.12	0.2184	S1-3
5/19/15 11:30 AM	18.5	154.83	0.2049	S1-3
5/19/15 12:30 PM	19.4	160.23	0.3000	S1-3
5/19/15 1:30 PM	19.6	148.64	0.2523	S1-3
5/19/15 2:30 PM	20.2	127.99	0.2806	S1-3
5/19/15 3:30 PM	20.0	102.81	0.2918	S1-3
5/19/15 8:30 AM	16.8	97.22	0.0191	S1-4
5/19/15 9:30 AM	16.9	125.09	0.0191	S1-4
5/19/15 10:30 AM	17.5	140.96	0.0191	S1-4
5/19/15 11:30 AM	18.5	142.26	0.0191	S1-4
5/19/15 12:30 PM	19.4	139.42	0.0191	S1-4
5/19/15 1:30 PM	19.6	133.62	0.0191	S1-4
5/19/15 2:30 PM	20.2	117.27	0.0191	S1-4
5/19/15 3:30 PM	20.0	98.68	0.0191	S1-4
5/19/15 8:30 AM	19.5	135.78	0.3706	S2-5
5/19/15 9:30 AM	20.2	172.79	0.3858	S2-5
5/19/15 10:30 AM	21.9	194.54	0.4001	S2-5
5/19/15 11:30 AM	24.1	179.49	0.3397	S2-5
5/19/15 12:30 PM	25.1	169.78	0.3585	S2-5
5/19/15 1:30 PM	25.5	161.20	0.3575	S2-5
5/19/15 2:30 PM	25.3	121.88	0.2780	S2-5
5/19/15 3:30 PM	24.8	102.77	0.2548	S2-5
5/19/15 8:30 AM	17.8			S2-1R
5/19/15 9:30 AM	17.9			S2-1R
5/19/15 10:30 AM	18.2			S2-1R
5/19/15 11:30 AM	18.5			S2-1R
5/19/15 12:30 PM	18.7			S2-1R
5/19/15 1:30 PM	19.1			S2-1R
5/19/15 2:30 PM	18.9			S2-1R
5/19/15 3:30 PM	18.5			S2-1R
5/19/15 8:30 AM	19.5	131.06	0.2802	S2-2
5/19/15 9:30 AM	20.2	156.54	0.2303	S2-2
5/19/15 10:30 AM	21.9	172.63	0.2314	S2-2
5/19/15 11:30 AM	24.1	170.25	0.2415	S2-2
5/19/15 12:30 PM	25.1	165.08	0.2825	S2-2
5/19/15 1:30 PM	25.5	154.69	0.2616	S2-2
5/19/15 2:30 PM	25.3	120.63	0.2241	S2-2
5/19/15 3:30 PM	24.8	101.93	0.2064	S2-2
5/19/15 8:30 AM	19.5	131.47	0.2625	S2-3
5/19/15 9:30 AM	20.2	147.59	0.1809	S2-3

5/19/15 10:30 AM	21.9	163.04	0.1822	S2-3
5/19/15 11:30 AM	24.1	157.61	0.1795	S2-3
5/19/15 12:30 PM	25.1	164.95	0.2592	S2-3
5/19/15 1:30 PM	25.5	152.89	0.2395	S2-3
5/19/15 2:30 PM	25.3	121.90	0.2242	S2-3
5/19/15 3:30 PM	24.8	102.81	0.2111	S2-3
5/19/15 8:30 AM	19.5	135.49	0.2851	S2-4
5/19/15 9:30 AM	20.2	154.05	0.1993	S2-4
5/19/15 10:30 AM	21.9	168.15	0.1959	S2-4
5/19/15 11:30 AM	24.1	163.90	0.1987	S2-4
5/19/15 12:30 PM	25.1	172.25	0.2911	S2-4
5/19/15 1:30 PM	25.5	155.69	0.2482	S2-4
5/19/15 2:30 PM	25.3	125.22	0.2510	S2-4
5/19/15 3:30 PM	24.8	106.44	0.2470	S2-4
5/19/15 8:30 AM	19.1			S3
5/19/15 9:30 AM	19.7			S3
5/19/15 10:30 AM	19.0			S3
5/19/15 11:30 AM	18.9			S3
5/19/15 12:30 PM	18.4			S3
5/19/15 1:30 PM	18.7			S3
5/19/15 2:30 PM	19.2			S3
5/19/15 3:30 PM	18.4			S3
5/19/15 8:30 AM	19.2			S4
5/19/15 9:30 AM	19.6			S4
5/19/15 10:30 AM	19.0			S4
5/19/15 11:30 AM	18.5			S4
5/19/15 12:30 PM	18.9			S4
5/19/15 1:30 PM	19.0			S4
5/19/15 2:30 PM	19.0			S4
5/19/15 3:30 PM	18.4			S4
5/19/15 8:30 AM	16.5	110.90	0.2213	S5-5
5/19/15 9:30 AM	16.6	131.52	0.1679	S5-5
5/19/15 10:30 AM	17.0	138.31	0.1696	S5-5
5/19/15 11:30 AM	18.3	122.11	0.1624	S5-5
5/19/15 12:30 PM	18.3	116.55	0.1978	S5-5
5/19/15 1:30 PM	18.6	109.49	0.1927	S5-5
5/19/15 2:30 PM	19.4	90.94	0.1538	S5-5
5/19/15 3:30 PM	19.2	74.91	0.1423	S5-5
5/19/15 8:30 AM	16.5	115.68	0.2539	S5-2
5/19/15 9:30 AM	16.6	135.62	0.1854	S5-2
5/19/15 10:30 AM	17.0	141.63	0.1879	S5-2
5/19/15 11:30 AM	18.3	122.44	0.1808	S5-2
5/19/15 12:30 PM	18.3	115.91	0.2297	S5-2
5/19/15 1:30 PM	18.6	108.27	0.2129	S5-2
5/19/15 2:30 PM	19.4	87.25	0.1912	S5-2
5/19/15 3:30 PM	19.2	68.03	0.1943	S5-2
5/19/15 8:30 AM	16.5	118.07	0.2676	S5-3
5/19/15 9:30 AM	16.6	138.77	0.2121	S5-3
5/19/15 10:30 AM	17.0	142.74	0.1920	S5-3
5/19/15 11:30 AM	18.3	122.63	0.1956	S5-3
5/19/15 12:30 PM	18.3	115.34	0.2695	S5-3
5/19/15 1:30 PM	18.6	107.45	0.2303	S5-3
5/19/15 2:30 PM	19.4	84.54	0.2142	S5-3
5/19/15 3:30 PM	19.2	61.38	0.2510	S5-3
5/19/15 8:30 AM	16.5	120.20	0.2826	S5-4

5/19/15 9:30 AM	16.6	140.56	0.2220	S5-4
5/19/15 10:30 AM	17.0	143.79	0.1990	S5-4
5/19/15 11:30 AM	18.3	122.71	0.1993	S5-4
5/19/15 12:30 PM	18.3	115.00	0.2874	S5-4
5/19/15 1:30 PM	18.6	106.90	0.2410	S5-4
5/19/15 2:30 PM	19.4	81.42	0.2529	S5-4
5/19/15 3:30 PM	19.2	57.10	0.2818	S5-4
5/19/15 8:30 AM	18.2			S6
5/19/15 9:30 AM	17.9			S6
5/19/15 10:30 AM	18.4			S6
5/19/15 11:30 AM	19.1			S6
5/19/15 12:30 PM	18.8			S6
5/19/15 1:30 PM	18.7			S6
5/19/15 2:30 PM	18.3			S6
5/19/15 3:30 PM	18.0			S6
5/19/15 8:30 AM				S7
5/19/15 9:30 AM				S7
5/19/15 10:30 AM				S7
5/19/15 11:30 AM				S7
5/19/15 12:30 PM				S7
5/19/15 1:30 PM				S7
5/19/15 2:30 PM				S7
5/19/15 3:30 PM				S7

DE04

t	d.rhove.w.v	H	ustar	sample point
date	[g/m^3]	[W/m^2]	[m/s]	
5/19/15 8:15 PM	17.8	-49.69	0.0590	S1-5
5/19/15 9:15 PM	17.7	-109.13	0.1186	S1-5
5/19/15 10:15 PM	18.1	-139.93	0.1086	S1-5
5/19/15 11:15 PM	17.9	-178.85	0.1411	S1-5
5/20/15 12:15 AM	17.7	-201.33	0.1652	S1-5
5/20/15 1:15 AM	17.6	-185.79	0.1377	S1-5
5/20/15 2:15 AM	16.2	-179.01	0.1518	S1-5
5/20/15 3:15 AM	13.3	-169.33	0.1876	S1-5
5/20/15 4:15 AM	11.9	-123.42	0.1975	S1-5
5/20/15 5:15 AM	11.3	-55.05	0.2006	S1-5
5/20/15 6:15 AM	11.2	19.93	0.3032	S1-5
5/19/15 8:15 PM	17.8	-52.63	0.0587	S1-2
5/19/15 9:15 PM	17.7	-121.26	0.1338	S1-2
5/19/15 10:15 PM	18.1	-99.95	0.0223	S1-2
5/19/15 11:15 PM	17.9	-118.45	0.0223	S1-2
5/20/15 12:15 AM	17.7	-127.31	0.0223	S1-2
5/20/15 1:15 AM	17.6	-124.68	0.0223	S1-2
5/20/15 2:15 AM	16.2	-132.90	0.0443	S1-2
5/20/15 3:15 AM	13.3			S1-2
5/20/15 4:15 AM	11.9			S1-2
5/20/15 5:15 AM	11.3	-55.04	0.1541	S1-2
5/20/15 6:15 AM	11.2	19.93	0.2409	S1-2
5/19/15 8:15 PM	17.8	-57.41	0.0686	S1-3
5/19/15 9:15 PM	17.7	-123.48	0.1282	S1-3
5/19/15 10:15 PM	18.1	-162.54	0.1292	S1-3
5/19/15 11:15 PM	17.9	-186.27	0.1207	S1-3
5/20/15 12:15 AM	17.7	-222.31	0.1690	S1-3
5/20/15 1:15 AM	17.6	-204.42	0.1397	S1-3
5/20/15 2:15 AM	16.2	-219.18	0.2158	S1-3
5/20/15 3:15 AM	13.3	-208.10	0.2806	S1-3
5/20/15 4:15 AM	11.9	-146.36	0.2638	S1-3

5/20/15 5:15 AM	11.3	-66.72	0.2483	S1-3
5/20/15 6:15 AM	11.2	19.88	0.3560	S1-3
5/19/15 8:15 PM	17.8	-40.71	0.0191	S1-4
5/19/15 9:15 PM	17.7	-74.37	0.0191	S1-4
5/19/15 10:15 PM	18.1	-99.95	0.0191	S1-4
5/19/15 11:15 PM	17.9	-118.45	0.0191	S1-4
5/20/15 12:15 AM	17.7	-127.31	0.0191	S1-4
5/20/15 1:15 AM	17.6	-124.68	0.0191	S1-4
5/20/15 2:15 AM	16.2	-116.52	0.0191	S1-4
5/20/15 3:15 AM	13.3	-102.92	0.0191	S1-4
5/20/15 4:15 AM	11.9	-73.05	0.0191	S1-4
5/20/15 5:15 AM	11.3	-30.15	0.0191	S1-4
5/20/15 6:15 AM	11.2	20.07	-0.2027	S1-4
5/19/15 8:15 PM	22.4	-59.77	0.2898	S2-5
5/19/15 9:15 PM	21.3	-108.87	0.1780	S2-5
5/19/15 10:15 PM	20.9	-163.60	0.2274	S2-5
5/19/15 11:15 PM	20.2	-182.28	0.1790	S2-5
5/20/15 12:15 AM	19.7	-185.18	0.1455	S2-5
5/20/15 1:15 AM	19.3	-193.32	0.1762	S2-5
5/20/15 2:15 AM	18.1	-189.54	0.2151	S2-5
5/20/15 3:15 AM	15.7	-150.18	0.1647	S2-5
5/20/15 4:15 AM	14.2	-108.88	0.1966	S2-5
5/20/15 5:15 AM	13.7	-40.24	0.2549	S2-5
5/20/15 6:15 AM	13.7	37.25	0.3147	S2-5
5/19/15 8:15 PM	17.7			S2-1
5/19/15 9:15 PM	18.0			S2-1
5/19/15 10:15 PM	18.8			S2-1
5/19/15 11:15 PM	18.4			S2-1
5/20/15 12:15 AM	18.0			S2-1
5/20/15 1:15 AM	18.3			S2-1
5/20/15 2:15 AM	16.1			S2-1
5/20/15 3:15 AM	11.7			S2-1
5/20/15 4:15 AM	10.6			S2-1
5/20/15 5:15 AM	10.2			S2-1
5/20/15 6:15 AM	10.2			S2-1
5/19/15 8:15 PM	22.4	-52.80	0.1348	S2-2
5/19/15 9:15 PM	21.3	-111.55	0.1597	S2-2
5/19/15 10:15 PM	20.9	-155.94	0.1623	S2-2
5/19/15 11:15 PM	20.2	-183.35	0.1516	S2-2
5/20/15 12:15 AM	19.7	-191.25	0.1346	S2-2
5/20/15 1:15 AM	19.3	-168.67	0.0922	S2-2
5/20/15 2:15 AM	18.1	-179.46	0.1483	S2-2
5/20/15 3:15 AM	15.7	-166.94	0.1979	S2-2
5/20/15 4:15 AM	14.2	-117.51	0.2153	S2-2
5/20/15 5:15 AM	13.7	-42.47	0.2111	S2-2
5/20/15 6:15 AM	13.7	38.68	0.2998	S2-2
5/19/15 8:15 PM	22.4	-43.35	0.0641	S2-3
5/19/15 9:15 PM	21.3	-104.35	0.1177	S2-3
5/19/15 10:15 PM	20.9	-139.88	0.1042	S2-3
5/19/15 11:15 PM	20.2	-177.53	0.1243	S2-3
5/20/15 12:15 AM	19.7	-199.61	0.1408	S2-3
5/20/15 1:15 AM	19.3	-172.15	0.0902	S2-3
5/20/15 2:15 AM	18.1	-192.34	0.1711	S2-3
5/20/15 3:15 AM	15.7	-181.57	0.2439	S2-3
5/20/15 4:15 AM	14.2	-125.36	0.2503	S2-3
5/20/15 5:15 AM	13.7	-45.02	0.2410	S2-3
5/20/15 6:15 AM	13.7	40.77	0.3406	S2-3

5/19/15 8:15 PM	22.4	-46.76	0.0785	S2-4
5/19/15 9:15 PM	21.3	-117.22	0.1601	S2-4
5/19/15 10:15 PM	20.9	-152.80	0.1305	S2-4
5/19/15 11:15 PM	20.2	-191.05	0.1484	S2-4
5/20/15 12:15 AM	19.7	-214.44	0.1678	S2-4
5/20/15 1:15 AM	19.3	-197.55	0.1349	S2-4
5/20/15 2:15 AM	18.1	-209.19	0.2165	S2-4
5/20/15 3:15 AM	15.7	-191.84	0.2843	S2-4
5/20/15 4:15 AM	14.2	-131.12	0.2826	S2-4
5/20/15 5:15 AM	13.7	-46.81	0.2668	S2-4
5/20/15 6:15 AM	13.7	42.28	0.3785	S2-4
5/19/15 8:15 PM	18.9			S3
5/19/15 9:15 PM	19.8			S3
5/19/15 10:15 PM	20.5			S3
5/19/15 11:15 PM	19.8			S3
5/20/15 12:15 AM	19.2			S3
5/20/15 1:15 AM	18.3			S3
5/20/15 2:15 AM	16.4			S3
5/20/15 3:15 AM	12.0			S3
5/20/15 4:15 AM	10.4			S3
5/20/15 5:15 AM	10.0			S3
5/20/15 6:15 AM	9.8			S3
5/19/15 8:15 PM	17.6			S4
5/19/15 9:15 PM	18.9			S4
5/19/15 10:15 PM	20.6			S4
5/19/15 11:15 PM	20.1			S4
5/20/15 12:15 AM	19.6			S4
5/20/15 1:15 AM	19.6			S4
5/20/15 2:15 AM	17.4			S4
5/20/15 3:15 AM	12.2			S4
5/20/15 4:15 AM	11.3			S4
5/20/15 5:15 AM	10.9			S4
5/20/15 6:15 AM	10.8			S4
5/19/15 8:15 PM	16.5	-67.62	0.1205	S5-5
5/19/15 9:15 PM	16.5	-109.40	0.1080	S5-5
5/19/15 10:15 PM	17.0	-116.73	0.0498	S5-5
5/19/15 11:15 PM	16.8	-154.40	0.0772	S5-5
5/20/15 12:15 AM	16.5	-161.14	0.0686	S5-5
5/20/15 1:15 AM	15.8	-135.64	0.0273	S5-5
5/20/15 2:15 AM	14.5	-177.22	0.1236	S5-5
5/20/15 3:15 AM	11.4	-175.83	0.1762	S5-5
5/20/15 4:15 AM	9.9	-109.96	0.1071	S5-5
5/20/15 5:15 AM	9.5	-50.20	0.1008	S5-5
5/20/15 6:15 AM	9.4	11.64	0.1874	S5-5
5/19/15 8:15 PM	16.5	-68.08	0.1019	S5-2
5/19/15 9:15 PM	16.5	-132.54	0.1572	S5-2
5/19/15 10:15 PM	17.0	-154.30	0.1122	S5-2
5/19/15 11:15 PM	16.8	-190.80	0.1312	S5-2
5/20/15 12:15 AM	16.5	-198.06	0.1181	S5-2
5/20/15 1:15 AM	15.8	-148.55	0.0385	S5-2
5/20/15 2:15 AM	14.5	-194.70	0.1413	S5-2
5/20/15 3:15 AM	11.4	-194.75	0.2033	S5-2
5/20/15 4:15 AM	9.9	-135.24	0.1711	S5-2
5/20/15 5:15 AM	9.5	-64.83	0.1697	S5-2
5/20/15 6:15 AM	9.4	8.88	0.2476	S5-2
5/19/15 8:15 PM	16.5	-56.69	0.0577	S5-3

5/19/15 9:15 PM	16.5	-140.97	0.1709	S5-3
5/19/15 10:15 PM	17.0	-167.47	0.1313	S5-3
5/19/15 11:15 PM	16.8	-205.70	0.1513	S5-3
5/20/15 12:15 AM	16.5	-218.39	0.1469	S5-3
5/20/15 1:15 AM	15.8	-199.12	0.1095	S5-3
5/20/15 2:15 AM	14.5	-221.87	0.1999	S5-3
5/20/15 3:15 AM	11.4	-218.05	0.2722	S5-3
5/20/15 4:15 AM	9.9	-149.10	0.2141	S5-3
5/20/15 5:15 AM	9.5	-72.23	0.2122	S5-3
5/20/15 6:15 AM	9.4	7.22	0.2944	S5-3
5/19/15 8:15 PM	16.5	-62.67	0.0709	S5-4
5/19/15 9:15 PM	16.5	-148.59	0.1879	S5-4
5/19/15 10:15 PM	17.0	-176.78	0.1459	S5-4
5/19/15 11:15 PM	16.8	-214.12	0.1619	S5-4
5/20/15 12:15 AM	16.5	-228.18	0.1594	S5-4
5/20/15 1:15 AM	15.8	-219.28	0.1420	S5-4
5/20/15 2:15 AM	14.5	-232.71	0.2228	S5-4
5/20/15 3:15 AM	11.4	-226.91	0.2974	S5-4
5/20/15 4:15 AM	9.9	-160.26	0.2602	S5-4
5/20/15 5:15 AM	9.5	-77.84	0.2542	S5-4
5/20/15 6:15 AM	9.4	5.97	0.3412	S5-4
5/19/15 8:15 PM	17.1			S6
5/19/15 9:15 PM	16.9			S6
5/19/15 10:15 PM	17.5			S6
5/19/15 11:15 PM	17.5			S6
5/20/15 12:15 AM	17.2			S6
5/20/15 1:15 AM	17.0			S6
5/20/15 2:15 AM	15.5			S6
5/20/15 3:15 AM	12.2			S6
5/20/15 4:15 AM	10.6			S6
5/20/15 5:15 AM	10.1			S6
5/20/15 6:15 AM	10.0			S6
5/19/15 8:15 PM				S7
5/19/15 9:15 PM				S7
5/19/15 10:15 PM				S7
5/19/15 11:15 PM				S7
5/20/15 12:15 AM				S7
5/20/15 1:15 AM				S7
5/20/15 2:15 AM				S7
5/20/15 3:15 AM				S7
5/20/15 4:15 AM				S7
5/20/15 5:15 AM				S7
5/20/15 6:15 AM				S7

DE05

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date	[g/m^3]	[W/m^2]	[m/s]	
5/20/15 7:50 AM	10.5	86.60	0.3827	S1-5
5/20/15 8:50 AM	10.3	119.54	0.4123	S1-5
5/20/15 9:50 AM	10.5	147.66	0.4227	S1-5
5/20/15 10:50 AM	10.8	167.24	0.4184	S1-5
5/20/15 11:50 AM	11.2	179.53	0.4143	S1-5
5/20/15 12:50 PM	11.5	172.82	0.4094	S1-5
5/20/15 1:50 PM	11.6	156.50	0.4563	S1-5
5/20/15 2:50 PM	11.7	133.39	0.4156	S1-5
5/20/15 3:50 PM	11.7	105.28	0.4145	S1-5
5/20/15 4:50 PM	11.1	71.93	0.3720	S1-5
5/20/15 5:50 PM	10.6	26.75	0.3273	S1-5
5/20/15 6:50 PM	10.2	-20.11	0.2820	S1-5

5/20/15 7:50 AM	10.5	85.06	0.5178	S1-2
5/20/15 8:50 AM	10.3			S1-2
5/20/15 9:50 AM	10.5	145.22	0.0223	S1-2
5/20/15 10:50 AM	10.8	160.88	0.0223	S1-2
5/20/15 11:50 AM	11.2	168.75	0.0223	S1-2
5/20/15 12:50 PM	11.5	164.43	0.0223	S1-2
5/20/15 1:50 PM	11.6	153.05	0.0223	S1-2
5/20/15 2:50 PM	11.7	135.71	0.0223	S1-2
5/20/15 3:50 PM	11.7	113.14	0.0223	S1-2
5/20/15 4:50 PM	11.1	85.69	0.0223	S1-2
5/20/15 5:50 PM	10.6	48.58	0.0223	S1-2
5/20/15 6:50 PM	10.2	7.43	0.0699	S1-2
5/20/15 7:50 AM	10.5	84.70	0.5204	S1-3
5/20/15 8:50 AM	10.3	118.31	0.6024	S1-3
5/20/15 9:50 AM	10.5	149.59	0.6011	S1-3
5/20/15 10:50 AM	10.8	171.91	0.5644	S1-3
5/20/15 11:50 AM	11.2	188.04	0.5763	S1-3
5/20/15 12:50 PM	11.5	178.59	0.5286	S1-3
5/20/15 1:50 PM	11.6	158.61	0.5652	S1-3
5/20/15 2:50 PM	11.7	131.99	0.5070	S1-3
5/20/15 3:50 PM	11.7	99.51	0.5537	S1-3
5/20/15 4:50 PM	11.1	61.39	0.5000	S1-3
5/20/15 5:50 PM	10.6	9.52	0.4354	S1-3
5/20/15 6:50 PM	10.2	-43.32	0.3728	S1-3
5/20/15 7:50 AM	10.5	89.17	0.0191	S1-4
5/20/15 8:50 AM	10.3	121.01	0.0191	S1-4
5/20/15 9:50 AM	10.5	145.22	0.0191	S1-4
5/20/15 10:50 AM	10.8	160.88	0.0191	S1-4
5/20/15 11:50 AM	11.2	168.75	0.0191	S1-4
5/20/15 12:50 PM	11.5	164.43	0.0191	S1-4
5/20/15 1:50 PM	11.6	153.05	0.0191	S1-4
5/20/15 2:50 PM	11.7	135.71	0.0191	S1-4
5/20/15 3:50 PM	11.7	113.14	0.0191	S1-4
5/20/15 4:50 PM	11.1	85.69	0.0191	S1-4
5/20/15 5:50 PM	10.6	48.58	0.0191	S1-4
5/20/15 6:50 PM	10.2	7.43	0.0986	S1-4
5/20/15 7:50 AM	12.3	74.99	0.4797	S2-5
5/20/15 8:50 AM	12.1	100.13	0.5317	S2-5
5/20/15 9:50 AM	12.2	120.47	0.5091	S2-5
5/20/15 10:50 AM	12.5	144.33	0.5016	S2-5
5/20/15 11:50 AM	12.6	158.22	0.4941	S2-5
5/20/15 12:50 PM	13.0	150.96	0.4322	S2-5
5/20/15 1:50 PM	12.7	134.93	0.4003	S2-5
5/20/15 2:50 PM	13.0	111.26	0.3842	S2-5
5/20/15 3:50 PM	12.5	83.88	0.4433	S2-5
5/20/15 4:50 PM	12.1	47.07	0.3915	S2-5
5/20/15 5:50 PM	11.7	6.95	0.3760	S2-5
5/20/15 6:50 PM	11.2	-28.24	0.3672	S2-5
5/20/15 7:50 AM	9.3			S2-1R
5/20/15 8:50 AM	9.2			S2-1R
5/20/15 9:50 AM	9.1			S2-1R
5/20/15 10:50 AM	9.3			S2-1R
5/20/15 11:50 AM	9.6			S2-1R
5/20/15 12:50 PM	10.5			S2-1R
5/20/15 1:50 PM	10.3			S2-1R
5/20/15 2:50 PM	10.3			S2-1R
5/20/15 3:50 PM	10.0			S2-1R

5/20/15 4:50 PM	9.8			S2-1R
5/20/15 5:50 PM	9.3			S2-1R
5/20/15 6:50 PM	8.5			S2-1R
5/20/15 7:50 AM	12.3	73.47	0.4950	S2-2
5/20/15 8:50 AM	12.1	98.47	0.5295	S2-2
5/20/15 9:50 AM	12.2	119.08	0.5075	S2-2
5/20/15 10:50 AM	12.5	144.52	0.4930	S2-2
5/20/15 11:50 AM	12.6	159.39	0.4884	S2-2
5/20/15 12:50 PM	13.0	151.47	0.4215	S2-2
5/20/15 1:50 PM	12.7	134.22	0.3991	S2-2
5/20/15 2:50 PM	13.0	109.16	0.3850	S2-2
5/20/15 3:50 PM	12.5	79.96	0.4444	S2-2
5/20/15 4:50 PM	12.1	40.35	0.3965	S2-2
5/20/15 5:50 PM	11.7	-0.37	0.3618	S2-2
5/20/15 6:50 PM	11.2	-35.00	0.3373	S2-2
5/20/15 7:50 AM	12.3	72.21	0.5353	S2-3
5/20/15 8:50 AM	12.1	96.69	0.5830	S2-3
5/20/15 9:50 AM	12.2	117.38	0.5705	S2-3
5/20/15 10:50 AM	12.5	144.74	0.5444	S2-3
5/20/15 11:50 AM	12.6	160.76	0.5418	S2-3
5/20/15 12:50 PM	13.0	152.20	0.4712	S2-3
5/20/15 1:50 PM	12.7	133.15	0.4634	S2-3
5/20/15 2:50 PM	13.0	106.41	0.4350	S2-3
5/20/15 3:50 PM	12.5	75.03	0.5027	S2-3
5/20/15 4:50 PM	12.1	32.79	0.4432	S2-3
5/20/15 5:50 PM	11.7	-9.70	0.3988	S2-3
5/20/15 6:50 PM	11.2	-43.73	0.3659	S2-3
5/20/15 7:50 AM	12.3	71.48	0.5561	S2-4
5/20/15 8:50 AM	12.1	95.58	0.6155	S2-4
5/20/15 9:50 AM	12.2	116.28	0.6107	S2-4
5/20/15 10:50 AM	12.5	144.87	0.5717	S2-4
5/20/15 11:50 AM	12.6	161.74	0.5829	S2-4
5/20/15 12:50 PM	13.0	152.80	0.5187	S2-4
5/20/15 1:50 PM	12.7	132.08	0.5393	S2-4
5/20/15 2:50 PM	13.0	103.84	0.4907	S2-4
5/20/15 3:50 PM	12.5	71.41	0.5483	S2-4
5/20/15 4:50 PM	12.1	27.08	0.4813	S2-4
5/20/15 5:50 PM	11.7	-15.99	0.4222	S2-4
5/20/15 6:50 PM	11.2	-48.95	0.3755	S2-4
5/20/15 7:50 AM	9.3			S3
5/20/15 8:50 AM	11.4			S3
5/20/15 9:50 AM	11.5			S3
5/20/15 10:50 AM	11.1			S3
5/20/15 11:50 AM	10.3			S3
5/20/15 12:50 PM	10.5			S3
5/20/15 1:50 PM	10.9			S3
5/20/15 2:50 PM	11.1			S3
5/20/15 3:50 PM	10.5			S3
5/20/15 4:50 PM	9.7			S3
5/20/15 5:50 PM	9.3			S3
5/20/15 6:50 PM	9.4			S3
5/20/15 7:50 AM	9.5			S4
5/20/15 8:50 AM	10.5			S4
5/20/15 9:50 AM	10.3			S4
5/20/15 10:50 AM	10.5			S4
5/20/15 11:50 AM	10.2			S4
5/20/15 12:50 PM	10.4			S4

5/20/15 1:50 PM	10.1			S4
5/20/15 2:50 PM	10.5			S4
5/20/15 3:50 PM	10.0			S4
5/20/15 4:50 PM	9.5			S4
5/20/15 5:50 PM	9.8			S4
5/20/15 6:50 PM	9.8			S4
5/20/15 7:50 AM	9.8	57.94	0.4190	S5-5
5/20/15 8:50 AM	9.3	83.64	0.4611	S5-5
5/20/15 9:50 AM	9.3	107.79	0.4188	S5-5
5/20/15 10:50 AM	9.8	129.16	0.4098	S5-5
5/20/15 11:50 AM	9.9	137.35	0.4191	S5-5
5/20/15 12:50 PM	10.1	138.45	0.3470	S5-5
5/20/15 1:50 PM	10.1	127.68	0.3223	S5-5
5/20/15 2:50 PM	10.2	105.65	0.3096	S5-5
5/20/15 3:50 PM	9.8	73.67	0.4090	S5-5
5/20/15 4:50 PM	9.5	39.60	0.3547	S5-5
5/20/15 5:50 PM	9.2	2.73	0.2929	S5-5
5/20/15 6:50 PM	8.2	-31.71	0.2062	S5-5
5/20/15 7:50 AM	9.8	50.19	0.4761	S5-2
5/20/15 8:50 AM	9.3	76.55	0.4963	S5-2
5/20/15 9:50 AM	9.3	101.23	0.4576	S5-2
5/20/15 10:50 AM	9.8	124.26	0.4593	S5-2
5/20/15 11:50 AM	9.9	133.88	0.4475	S5-2
5/20/15 12:50 PM	10.1	135.02	0.3830	S5-2
5/20/15 1:50 PM	10.1	123.50	0.3574	S5-2
5/20/15 2:50 PM	10.2	100.48	0.3312	S5-2
5/20/15 3:50 PM	9.8	67.32	0.4073	S5-2
5/20/15 4:50 PM	9.5	30.67	0.3602	S5-2
5/20/15 5:50 PM	9.2	-13.27	0.3257	S5-2
5/20/15 6:50 PM	8.2	-55.67	0.2680	S5-2
5/20/15 7:50 AM	9.8	44.97	0.5235	S5-3
5/20/15 8:50 AM	9.3	69.20	0.5769	S5-3
5/20/15 9:50 AM	9.3	93.20	0.5630	S5-3
5/20/15 10:50 AM	9.8	120.08	0.5223	S5-3
5/20/15 11:50 AM	9.9	129.40	0.5391	S5-3
5/20/15 12:50 PM	10.1	130.47	0.4736	S5-3
5/20/15 1:50 PM	10.1	115.46	0.4979	S5-3
5/20/15 2:50 PM	10.2	90.27	0.4443	S5-3
5/20/15 3:50 PM	9.8	55.30	0.5099	S5-3
5/20/15 4:50 PM	9.5	15.79	0.4419	S5-3
5/20/15 5:50 PM	9.2	-30.09	0.3893	S5-3
5/20/15 6:50 PM	8.2	-69.37	0.2877	S5-3
5/20/15 7:50 AM	9.8	41.86	0.5487	S5-4
5/20/15 8:50 AM	9.3	65.50	0.6101	S5-4
5/20/15 9:50 AM	9.3	88.99	0.6112	S5-4
5/20/15 10:50 AM	9.8	117.39	0.5619	S5-4
5/20/15 11:50 AM	9.9	127.21	0.5759	S5-4
5/20/15 12:50 PM	10.1	128.04	0.5165	S5-4
5/20/15 1:50 PM	10.1	111.99	0.5502	S5-4
5/20/15 2:50 PM	10.2	85.44	0.4906	S5-4
5/20/15 3:50 PM	9.8	49.65	0.5483	S5-4
5/20/15 4:50 PM	9.5	7.65	0.4806	S5-4
5/20/15 5:50 PM	9.2	-39.62	0.4143	S5-4
5/20/15 6:50 PM	8.2	-80.65	0.3237	S5-4
5/20/15 7:50 AM	9.9			S6
5/20/15 8:50 AM	9.6			S6
5/20/15 9:50 AM	9.3			S6

5/20/15 10:50 AM	9.8			S6
5/20/15 11:50 AM	9.9			S6
5/20/15 12:50 PM	10.0			S6
5/20/15 1:50 PM	9.5			S6
5/20/15 2:50 PM	9.9			S6
5/20/15 3:50 PM	9.6			S6
5/20/15 4:50 PM	9.2			S6
5/20/15 5:50 PM	9.0			S6
5/20/15 6:50 PM	8.8			S6
5/20/15 7:50 AM				S7
5/20/15 8:50 AM				S7
5/20/15 9:50 AM				S7
5/20/15 10:50 AM				S7
5/20/15 11:50 AM				S7
5/20/15 12:50 PM				S7
5/20/15 1:50 PM				S7
5/20/15 2:50 PM				S7
5/20/15 3:50 PM				S7
5/20/15 4:50 PM				S7
5/20/15 5:50 PM				S7
5/20/15 6:50 PM				S7

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date	[g/m^3]	[W/m^2]	[m/s]	
5/20/15 8:15 PM	9.4	-101.56	0.1775	S1-5
5/20/15 9:15 PM	9.0	-156.06	0.1359	S1-5
5/20/15 10:15 PM	8.8	-195.21	0.1083	S1-5
5/20/15 11:15 PM	8.6	-228.99	0.1080	S1-5
5/21/15 12:15 AM	8.1	-241.19	0.0969	S1-5
5/21/15 1:15 AM	7.9	-239.87	0.0982	S1-5
5/21/15 2:15 AM	7.8	-216.27	0.0969	S1-5
5/21/15 3:15 AM	8.0	-164.79	0.0768	S1-5
5/21/15 4:15 AM	8.1	-129.48	0.1483	S1-5
5/21/15 5:15 AM	8.3	-58.92	0.1672	S1-5
5/21/15 6:15 AM	8.3	21.87	0.2091	S1-5
5/20/15 8:15 PM	9.4			S1-2
5/20/15 9:15 PM	9.0	-188.91	0.2325	S1-2
5/20/15 10:15 PM	8.8	-148.74	0.0223	S1-2
5/20/15 11:15 PM	8.6	-176.38	0.0223	S1-2
5/21/15 12:15 AM	8.1	-191.82	0.0223	S1-2
5/21/15 1:15 AM	7.9	-191.17	0.0223	S1-2
5/21/15 2:15 AM	7.8	-173.02	0.0223	S1-2
5/21/15 3:15 AM	8.0	-137.72	0.0223	S1-2
5/21/15 4:15 AM	8.1	-91.17	0.0223	S1-2
5/21/15 5:15 AM	8.3	-36.43	0.0223	S1-2
5/21/15 6:15 AM	8.3	22.15	2.5815	S1-2
5/20/15 8:15 PM	9.4	-118.25	0.2228	S1-3
5/20/15 9:15 PM	9.0	-184.80	0.1938	S1-3
5/20/15 10:15 PM	8.8	-223.05	0.1386	S1-3
5/20/15 11:15 PM	8.6	-251.64	0.1203	S1-3
5/21/15 12:15 AM	8.1	-263.74	0.1074	S1-3
5/21/15 1:15 AM	7.9	-253.47	0.0947	S1-3
5/21/15 2:15 AM	7.8	-244.09	0.1247	S1-3
5/21/15 3:15 AM	8.0	-183.25	0.0930	S1-3
5/21/15 4:15 AM	8.1	-128.13	0.1075	S1-3
5/21/15 5:15 AM	8.3	-58.06	0.1205	S1-3
5/21/15 6:15 AM	8.3	21.90	0.1521	S1-3

5/20/15 8:15 PM	9.4	-61.61	0.0191	S1-4
5/20/15 9:15 PM	9.0	-109.95	0.0191	S1-4
5/20/15 10:15 PM	8.8	-148.74	0.0191	S1-4
5/20/15 11:15 PM	8.6	-176.38	0.0191	S1-4
5/21/15 12:15 AM	8.1	-191.82	0.0191	S1-4
5/21/15 1:15 AM	7.9	-191.17	0.0191	S1-4
5/21/15 2:15 AM	7.8	-173.02	0.0191	S1-4
5/21/15 3:15 AM	8.0	-137.72	0.0191	S1-4
5/21/15 4:15 AM	8.1	-91.17	0.0191	S1-4
5/21/15 5:15 AM	8.3	-36.43	0.0191	S1-4
5/21/15 6:15 AM	8.3	22.15	0.0191	S1-4
5/20/15 8:15 PM	12.0	-101.92	0.4182	S2-5
5/20/15 9:15 PM	11.6	-173.60	0.3917	S2-5
5/20/15 10:15 PM	11.5	-231.29	0.3463	S2-5
5/20/15 11:15 PM	11.1	-269.76	0.2885	S2-5
5/21/15 12:15 AM	10.5	-288.01	0.2719	S2-5
5/21/15 1:15 AM	10.2	-283.65	0.2708	S2-5
5/21/15 2:15 AM	10.2	-256.35	0.2862	S2-5
5/21/15 3:15 AM	10.4	-202.00	0.2972	S2-5
5/21/15 4:15 AM	10.1	-114.22	0.1329	S2-5
5/21/15 5:15 AM	9.9	-43.34	0.1164	S2-5
5/21/15 6:15 AM	10.3	32.97	0.2090	S2-5
5/20/15 8:15 PM	8.9			S2-1R
5/20/15 9:15 PM	8.7			S2-1R
5/20/15 10:15 PM	8.6			S2-1R
5/20/15 11:15 PM	8.3			S2-1R
5/21/15 12:15 AM	7.8			S2-1R
5/21/15 1:15 AM	7.6			S2-1R
5/21/15 2:15 AM	7.7			S2-1R
5/21/15 3:15 AM	7.8			S2-1R
5/21/15 4:15 AM	7.6			S2-1R
5/21/15 5:15 AM	7.5			S2-1R
5/21/15 6:15 AM	7.7			S2-1R
5/20/15 8:15 PM	12.0	-91.55	0.1814	S2-2
5/20/15 9:15 PM	11.6	-156.78	0.1719	S2-2
5/20/15 10:15 PM	11.5	-211.34	0.1704	S2-2
5/20/15 11:15 PM	11.1	-251.95	0.1763	S2-2
5/21/15 12:15 AM	10.5	-268.74	0.1647	S2-2
5/21/15 1:15 AM	10.2	-261.97	0.1549	S2-2
5/21/15 2:15 AM	10.2	-235.74	0.1588	S2-2
5/21/15 3:15 AM	10.4	-187.58	0.1630	S2-2
5/21/15 4:15 AM	10.1	-114.79	0.1130	S2-2
5/21/15 5:15 AM	9.9	-45.05	0.1132	S2-2
5/21/15 6:15 AM	10.3	32.96	0.1799	S2-2
5/20/15 8:15 PM	12.0	-92.04	0.1682	S2-3
5/20/15 9:15 PM	11.6	-155.86	0.1526	S2-3
5/20/15 10:15 PM	11.5	-200.80	0.1247	S2-3
5/20/15 11:15 PM	11.1	-236.61	0.1221	S2-3
5/21/15 12:15 AM	10.5	-253.99	0.1166	S2-3
5/21/15 1:15 AM	10.2	-243.16	0.1002	S2-3
5/21/15 2:15 AM	10.2	-225.32	0.1171	S2-3
5/21/15 3:15 AM	10.4	-171.71	0.0987	S2-3
5/21/15 4:15 AM	10.1	-108.89	0.0807	S2-3
5/21/15 5:15 AM	9.9	-43.87	0.0925	S2-3
5/21/15 6:15 AM	10.3	31.76	0.1410	S2-3
5/20/15 8:15 PM	12.0	-100.07	0.2173	S2-4
5/20/15 9:15 PM	11.6	-167.77	0.1973	S2-4

5/20/15 10:15 PM	11.5	-211.16	0.1456	S2-4
5/20/15 11:15 PM	11.1	-243.59	0.1305	S2-4
5/21/15 12:15 AM	10.5	-257.34	0.1165	S2-4
5/21/15 1:15 AM	10.2	-247.64	0.1027	S2-4
5/21/15 2:15 AM	10.2	-230.71	0.1231	S2-4
5/21/15 3:15 AM	10.4	-173.90	0.0986	S2-4
5/21/15 4:15 AM	10.1	-114.85	0.0971	S2-4
5/21/15 5:15 AM	9.9	-46.49	0.1102	S2-4
5/21/15 6:15 AM	10.3	32.35	0.1475	S2-4
5/20/15 8:15 PM	8.3			S3
5/20/15 9:15 PM	8.1			S3
5/20/15 10:15 PM	8.5			S3
5/20/15 11:15 PM	8.5			S3
5/21/15 12:15 AM	8.0			S3
5/21/15 1:15 AM	7.9			S3
5/21/15 2:15 AM	7.9			S3
5/21/15 3:15 AM	8.1			S3
5/21/15 4:15 AM	8.4			S3
5/21/15 5:15 AM	8.0			S3
5/21/15 6:15 AM	8.3			S3
5/20/15 8:15 PM	8.6			S4
5/20/15 9:15 PM	8.4			S4
5/20/15 10:15 PM	8.3			S4
5/20/15 11:15 PM	8.0			S4
5/21/15 12:15 AM	7.5			S4
5/21/15 1:15 AM	7.2			S4
5/21/15 2:15 AM	7.3			S4
5/21/15 3:15 AM	7.4			S4
5/21/15 4:15 AM	7.4			S4
5/21/15 5:15 AM	7.1			S4
5/21/15 6:15 AM	7.3			S4
5/20/15 8:15 PM	8.2	-90.91	0.1042	S5-5
5/20/15 9:15 PM	7.5	-147.29	0.0863	S5-5
5/20/15 10:15 PM	7.7	-224.17	0.1628	S5-5
5/20/15 11:15 PM	7.6	-261.33	0.1650	S5-5
5/21/15 12:15 AM	7.1	-279.91	0.1620	S5-5
5/21/15 1:15 AM	6.8	-262.67	0.1296	S5-5
5/21/15 2:15 AM	6.8	-240.81	0.1377	S5-5
5/21/15 3:15 AM	7.1	-193.74	0.1372	S5-5
5/21/15 4:15 AM	7.0	-109.52	0.0606	S5-5
5/21/15 5:15 AM	6.9	-48.47	0.0616	S5-5
5/21/15 6:15 AM	7.1	18.08	0.0992	S5-5
5/20/15 8:15 PM	8.2	-106.94	0.1456	S5-2
5/20/15 9:15 PM	7.5	-161.62	0.1040	S5-2
5/20/15 10:15 PM	7.7	-230.95	0.1526	S5-2
5/20/15 11:15 PM	7.6	-269.57	0.1558	S5-2
5/21/15 12:15 AM	7.1	-289.25	0.1547	S5-2
5/21/15 1:15 AM	6.8	-273.89	0.1289	S5-2
5/21/15 2:15 AM	6.8	-250.50	0.1358	S5-2
5/21/15 3:15 AM	7.1	-201.68	0.1351	S5-2
5/21/15 4:15 AM	7.0	-117.48	0.0686	S5-2
5/21/15 5:15 AM	6.9	-53.96	0.0737	S5-2
5/21/15 6:15 AM	7.1	17.02	0.1118	S5-2
5/20/15 8:15 PM	8.2	-117.79	0.1819	S5-3
5/20/15 9:15 PM	7.5	-178.39	0.1387	S5-3
5/20/15 10:15 PM	7.7	-229.31	0.1349	S5-3
5/20/15 11:15 PM	7.6	-266.04	0.1342	S5-3

5/21/15 12:15 AM	7.1	-285.65	0.1334	S5-3
5/21/15 1:15 AM	6.8	-266.23	0.1038	S5-3
5/21/15 2:15 AM	6.8	-249.10	0.1206	S5-3
5/21/15 3:15 AM	7.1	-197.28	0.1120	S5-3
5/21/15 4:15 AM	7.0	-126.84	0.0852	S5-3
5/21/15 5:15 AM	6.9	-60.29	0.0955	S5-3
5/21/15 6:15 AM	7.1	16.09	0.1326	S5-3
5/20/15 8:15 PM	8.2	-125.83	0.2157	S5-4
5/20/15 9:15 PM	7.5	-193.26	0.1799	S5-4
5/20/15 10:15 PM	7.7	-236.37	0.1439	S5-4
5/20/15 11:15 PM	7.6	-269.63	0.1337	S5-4
5/21/15 12:15 AM	7.1	-286.67	0.1277	S5-4
5/21/15 1:15 AM	6.8	-268.97	0.1023	S5-4
5/21/15 2:15 AM	6.8	-253.34	0.1223	S5-4
5/21/15 3:15 AM	7.1	-195.99	0.1027	S5-4
5/21/15 4:15 AM	7.0	-133.19	0.0972	S5-4
5/21/15 5:15 AM	6.9	-63.22	0.1046	S5-4
5/21/15 6:15 AM	7.1	15.76	0.1368	S5-4
5/20/15 8:15 PM	7.9			S6
5/20/15 9:15 PM	7.7			S6
5/20/15 10:15 PM	7.7			S6
5/20/15 11:15 PM	7.7			S6
5/21/15 12:15 AM	7.5			S6
5/21/15 1:15 AM	7.4			S6
5/21/15 2:15 AM	7.3			S6
5/21/15 3:15 AM	7.5			S6
5/21/15 4:15 AM	7.5			S6
5/21/15 5:15 AM	7.3			S6
5/21/15 6:15 AM	7.5			S6
5/20/15 8:15 PM				S7
5/20/15 9:15 PM				S7
5/20/15 10:15 PM				S7
5/20/15 11:15 PM				S7
5/21/15 12:15 AM				S7
5/21/15 1:15 AM				S7
5/21/15 2:15 AM				S7
5/21/15 3:15 AM				S7
5/21/15 4:15 AM				S7
5/21/15 5:15 AM				S7
5/21/15 6:15 AM				S7

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date	[g/m^3]	[W/m^2]	[m/s]	
5/22/15 8:20 AM	10.4	119.40	0.3786	S1-5
5/22/15 9:20 AM	10.3	144.30	0.4507	S1-5
5/22/15 10:20 AM	10.4	154.79	0.4382	S1-5
5/22/15 11:20 AM	10.7	158.44	0.4620	S1-5
5/22/15 12:20 PM	11.3	155.52	0.4871	S1-5
5/22/15 1:20 PM	11.7	146.61	0.5205	S1-5
5/22/15 2:20 PM	11.3	134.81	0.5589	S1-5
5/22/15 3:20 PM	11.2	102.74	0.5654	S1-5
5/22/15 4:20 PM	11.0	69.43	0.5619	S1-5
5/22/15 5:20 PM	10.8	29.84	0.4968	S1-5
5/22/15 6:20 PM	10.6	-16.52	0.4580	S1-5
5/22/15 8:20 AM	10.4	114.20	0.0223	S1-2
5/22/15 9:20 AM	10.3	139.31	0.0223	S1-2
5/22/15 10:20 AM	10.4	153.65	0.0223	S1-2

5/22/15 11:20 AM	10.7	158.92	0.0223	S1-2
5/22/15 12:20 PM	11.3	157.13	0.0223	S1-2
5/22/15 1:20 PM	11.7	150.10	0.0223	S1-2
5/22/15 2:20 PM	11.3	141.82	0.0223	S1-2
5/22/15 3:20 PM	11.2	120.92	0.0223	S1-2
5/22/15 4:20 PM	11.0	96.25	0.0223	S1-2
5/22/15 5:20 PM	10.8	64.34	0.0223	S1-2
5/22/15 6:20 PM	10.6	27.11	-0.6301	S1-2
5/22/15 8:20 AM	10.4	122.70	0.4789	S1-3
5/22/15 9:20 AM	10.3	146.62	0.5075	S1-3
5/22/15 10:20 AM	10.4	155.32	0.4947	S1-3
5/22/15 11:20 AM	10.7	158.23	0.5076	S1-3
5/22/15 12:20 PM	11.3	154.94	0.5040	S1-3
5/22/15 1:20 PM	11.7	145.43	0.5284	S1-3
5/22/15 2:20 PM	11.3	133.07	0.5276	S1-3
5/22/15 3:20 PM	11.2	100.07	0.4833	S1-3
5/22/15 4:20 PM	11.0	65.60	0.4770	S1-3
5/22/15 5:20 PM	10.8	24.74	0.4162	S1-3
5/22/15 6:20 PM	10.6	-20.50	0.3417	S1-3
5/22/15 8:20 AM	10.4	114.20	0.0191	S1-4
5/22/15 9:20 AM	10.3	139.31	0.0191	S1-4
5/22/15 10:20 AM	10.4	153.65	0.0191	S1-4
5/22/15 11:20 AM	10.7	158.92	0.0191	S1-4
5/22/15 12:20 PM	11.3	157.13	0.0191	S1-4
5/22/15 1:20 PM	11.7	150.10	0.0191	S1-4
5/22/15 2:20 PM	11.3	141.82	0.0191	S1-4
5/22/15 3:20 PM	11.2	120.92	0.0191	S1-4
5/22/15 4:20 PM	11.0	96.25	0.0191	S1-4
5/22/15 5:20 PM	10.8	64.34	0.0191	S1-4
5/22/15 6:20 PM	10.6	27.11	0.0191	S1-4
5/22/15 8:20 AM	13.0	130.16	0.3314	S2-5
5/22/15 9:20 AM	12.9	143.97	0.3348	S2-5
5/22/15 10:20 AM	12.9	146.84	0.3459	S2-5
5/22/15 11:20 AM	12.5	155.04	0.3607	S2-5
5/22/15 12:20 PM	12.7	154.97	0.3761	S2-5
5/22/15 1:20 PM	12.5	143.41	0.4170	S2-5
5/22/15 2:20 PM	11.7	111.84	0.4203	S2-5
5/22/15 3:20 PM	11.3	79.95	0.4542	S2-5
5/22/15 4:20 PM	11.0	40.33	0.4510	S2-5
5/22/15 5:20 PM	11.0	3.89	0.3882	S2-5
5/22/15 6:20 PM	10.9	-24.12	0.3357	S2-5
5/22/15 8:20 AM	9.6			S2-1R
5/22/15 9:20 AM	9.8			S2-1R
5/22/15 10:20 AM	9.5			S2-1R
5/22/15 11:20 AM	9.4			S2-1R
5/22/15 12:20 PM	10.1			S2-1R
5/22/15 1:20 PM	10.1			S2-1R
5/22/15 2:20 PM	9.0			S2-1R
5/22/15 3:20 PM	8.9			S2-1R
5/22/15 4:20 PM	8.8			S2-1R
5/22/15 5:20 PM	8.6			S2-1R
5/22/15 6:20 PM	8.2			S2-1R
5/22/15 8:20 AM	13.0	133.04	0.3199	S2-2
5/22/15 9:20 AM	12.9	146.11	0.3305	S2-2
5/22/15 10:20 AM	12.9	147.86	0.3356	S2-2
5/22/15 11:20 AM	12.5	155.87	0.3491	S2-2
5/22/15 12:20 PM	12.7	155.71	0.3680	S2-2

5/22/15 1:20 PM	12.5	143.24	0.4069	S2-2
5/22/15 2:20 PM	11.7	108.72	0.4095	S2-2
5/22/15 3:20 PM	11.3	74.32	0.4460	S2-2
5/22/15 4:20 PM	11.0	31.94	0.4381	S2-2
5/22/15 5:20 PM	11.0	-6.56	0.3736	S2-2
5/22/15 6:20 PM	10.9	-34.55	0.3126	S2-2
5/22/15 8:20 AM	13.0	140.15	0.3953	S2-3
5/22/15 9:20 AM	12.9	151.06	0.4005	S2-3
5/22/15 10:20 AM	12.9	150.13	0.4052	S2-3
5/22/15 11:20 AM	12.5	157.59	0.4135	S2-3
5/22/15 12:20 PM	12.7	156.88	0.4189	S2-3
5/22/15 1:20 PM	12.5	143.00	0.4510	S2-3
5/22/15 2:20 PM	11.7	105.17	0.4438	S2-3
5/22/15 3:20 PM	11.3	69.80	0.4595	S2-3
5/22/15 4:20 PM	11.0	25.69	0.4471	S2-3
5/22/15 5:20 PM	11.0	-15.28	0.3822	S2-3
5/22/15 6:20 PM	10.9	-42.30	0.3038	S2-3
5/22/15 8:20 AM	13.0	145.89	0.4620	S2-4
5/22/15 9:20 AM	12.9	155.53	0.4761	S2-4
5/22/15 10:20 AM	12.9	152.23	0.4777	S2-4
5/22/15 11:20 AM	12.5	159.20	0.4824	S2-4
5/22/15 12:20 PM	12.7	158.04	0.4792	S2-4
5/22/15 1:20 PM	12.5	142.78	0.5018	S2-4
5/22/15 2:20 PM	11.7	101.33	0.4959	S2-4
5/22/15 3:20 PM	11.3	65.82	0.4825	S2-4
5/22/15 4:20 PM	11.0	19.94	0.4665	S2-4
5/22/15 5:20 PM	11.0	-22.51	0.3947	S2-4
5/22/15 6:20 PM	10.9	-48.64	0.2933	S2-4
5/22/15 8:20 AM	9.9			S3
5/22/15 9:20 AM	9.9			S3
5/22/15 10:20 AM	12.0			S3
5/22/15 11:20 AM	10.6			S3
5/22/15 12:20 PM	10.4			S3
5/22/15 1:20 PM	10.8			S3
5/22/15 2:20 PM	9.9			S3
5/22/15 3:20 PM	8.9			S3
5/22/15 4:20 PM	8.5			S3
5/22/15 5:20 PM	8.5			S3
5/22/15 6:20 PM	9.8			S3
5/22/15 8:20 AM	9.6			S4
5/22/15 9:20 AM	9.6			S4
5/22/15 10:20 AM	10.9			S4
5/22/15 11:20 AM	9.9			S4
5/22/15 12:20 PM	10.1			S4
5/22/15 1:20 PM	10.3			S4
5/22/15 2:20 PM	9.6			S4
5/22/15 3:20 PM	8.8			S4
5/22/15 4:20 PM	8.3			S4
5/22/15 5:20 PM	8.5			S4
5/22/15 6:20 PM	9.1			S4
5/22/15 8:20 AM	9.5	103.79	0.2810	S5-5
5/22/15 9:20 AM	10.8	123.66	0.2670	S5-5
5/22/15 10:20 AM	10.4	124.05	0.2761	S5-5
5/22/15 11:20 AM	10.7	128.67	0.2599	S5-5
5/22/15 12:20 PM	11.1	133.58	0.1786	S5-5
5/22/15 1:20 PM	10.8	131.86	0.1787	S5-5
5/22/15 2:20 PM	10.7	115.97	0.1729	S5-5

5/22/15 3:20 PM	10.2	93.32	0.1603	S5-5
5/22/15 4:20 PM	9.5	68.33	0.1422	S5-5
5/22/15 5:20 PM	9.3	33.64	0.1306	S5-5
5/22/15 6:20 PM	9.4	11.77	0.0913	S5-5
5/22/15 8:20 AM	9.5	102.42	0.3041	S5-2
5/22/15 9:20 AM	10.8	122.92	0.2874	S5-2
5/22/15 10:20 AM	10.4	120.91	0.2992	S5-2
5/22/15 11:20 AM	10.7	124.57	0.2957	S5-2
5/22/15 12:20 PM	11.1	127.32	0.2679	S5-2
5/22/15 1:20 PM	10.8	124.45	0.2931	S5-2
5/22/15 2:20 PM	10.7	104.99	0.2762	S5-2
5/22/15 3:20 PM	10.2	71.15	0.3035	S5-2
5/22/15 4:20 PM	9.5	33.70	0.3059	S5-2
5/22/15 5:20 PM	9.3	-12.68	0.2766	S5-2
5/22/15 6:20 PM	9.4	-32.34	0.2088	S5-2
5/22/15 8:20 AM	9.5	99.54	0.4254	S5-3
5/22/15 9:20 AM	10.8	120.92	0.4198	S5-3
5/22/15 10:20 AM	10.4	113.91	0.4116	S5-3
5/22/15 11:20 AM	10.7	115.65	0.4283	S5-3
5/22/15 12:20 PM	11.1	118.41	0.4063	S5-3
5/22/15 1:20 PM	10.8	115.84	0.4303	S5-3
5/22/15 2:20 PM	10.7	90.44	0.4277	S5-3
5/22/15 3:20 PM	10.2	52.65	0.4329	S5-3
5/22/15 4:20 PM	9.5	10.96	0.4123	S5-3
5/22/15 5:20 PM	9.3	-38.09	0.3446	S5-3
5/22/15 6:20 PM	9.4	-51.18	0.2568	S5-3
5/22/15 8:20 AM	9.5	98.36	0.4685	S5-4
5/22/15 9:20 AM	10.8	120.04	0.4748	S5-4
5/22/15 10:20 AM	10.4	110.58	0.4614	S5-4
5/22/15 11:20 AM	10.7	111.32	0.4900	S5-4
5/22/15 12:20 PM	11.1	113.78	0.4786	S5-4
5/22/15 1:20 PM	10.8	111.59	0.4959	S5-4
5/22/15 2:20 PM	10.7	83.37	0.4992	S5-4
5/22/15 3:20 PM	10.2	43.53	0.4879	S5-4
5/22/15 4:20 PM	9.5	-0.60	0.4581	S5-4
5/22/15 5:20 PM	9.3	-50.32	0.3631	S5-4
5/22/15 6:20 PM	9.4	-62.03	0.2848	S5-4
5/22/15 8:20 AM	9.9			S6
5/22/15 9:20 AM	9.8			S6
5/22/15 10:20 AM	10.1			S6
5/22/15 11:20 AM	9.6			S6
5/22/15 12:20 PM	9.9			S6
5/22/15 1:20 PM	9.8			S6
5/22/15 2:20 PM	8.9			S6
5/22/15 3:20 PM	8.7			S6
5/22/15 4:20 PM	8.4			S6
5/22/15 5:20 PM	8.6			S6
5/22/15 6:20 PM	8.6			S6
5/22/15 8:20 AM				S7
5/22/15 9:20 AM				S7
5/22/15 10:20 AM				S7
5/22/15 11:20 AM				S7
5/22/15 12:20 PM				S7
5/22/15 1:20 PM				S7
5/22/15 2:20 PM				S7
5/22/15 3:20 PM				S7
5/22/15 4:20 PM				S7

5/22/15 5:20 PM				S7
5/22/15 6:20 PM				S7

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date	[g/m^3]	[W/m^2]	[m/s]	
5/22/15 8:00 PM	10.4	-62.14	0.0879	S1-5
5/22/15 9:00 PM	10.1	-125.74	0.1101	S1-5
5/22/15 10:00 PM	10.1	-172.14	0.1067	S1-5
5/22/15 11:00 PM	9.9	-212.84	0.1169	S1-5
5/23/15 12:00 AM	9.9	-252.10	0.1631	S1-5
5/23/15 1:00 AM	9.4	-250.26	0.1512	S1-5
5/23/15 2:00 AM	8.6	-226.02	0.1241	S1-5
5/23/15 3:00 AM	7.5	-198.78	0.1305	S1-5
5/23/15 4:00 AM	7.0	-152.38	0.1510	S1-5
5/23/15 5:00 AM	6.8	-80.85	0.1541	S1-5
5/23/15 6:00 AM	6.9	2.84	0.1918	S1-5
5/22/15 8:00 PM	10.4	-45.32	0.0223	S1-2
5/22/15 9:00 PM	10.1	-91.01	0.0223	S1-2
5/22/15 10:00 PM	10.1	-128.41	0.0223	S1-2
5/22/15 11:00 PM	9.9	-157.64	0.0223	S1-2
5/23/15 12:00 AM	9.9	-171.95	0.0223	S1-2
5/23/15 1:00 AM	9.4	-174.54	0.0223	S1-2
5/23/15 2:00 AM	8.6	-167.41	0.0223	S1-2
5/23/15 3:00 AM	7.5	-146.06	0.0223	S1-2
5/23/15 4:00 AM	7.0	-107.38	0.0223	S1-2
5/23/15 5:00 AM	6.8	-54.10	0.0223	S1-2
5/23/15 6:00 AM	6.9	8.17	0.0726	S1-2
5/22/15 8:00 PM	10.4	-79.50	0.1367	S1-3
5/22/15 9:00 PM	10.1	-139.21	0.1175	S1-3
5/22/15 10:00 PM	10.1	-180.87	0.0967	S1-3
5/22/15 11:00 PM	9.9	-225.78	0.1105	S1-3
5/23/15 12:00 AM	9.9	-280.88	0.1870	S1-3
5/23/15 1:00 AM	9.4	-293.59	0.2139	S1-3
5/23/15 2:00 AM	8.6	-262.67	0.1717	S1-3
5/23/15 3:00 AM	7.5	-237.12	0.2068	S1-3
5/23/15 4:00 AM	7.0	-182.73	0.2498	S1-3
5/23/15 5:00 AM	6.8	-93.87	0.2082	S1-3
5/23/15 6:00 AM	6.9	0.15	0.2345	S1-3
5/22/15 8:00 PM	10.4	-45.32	0.0191	S1-4
5/22/15 9:00 PM	10.1	-91.01	0.0191	S1-4
5/22/15 10:00 PM	10.1	-128.41	0.0191	S1-4
5/22/15 11:00 PM	9.9	-157.64	0.0191	S1-4
5/23/15 12:00 AM	9.9	-171.95	0.0191	S1-4
5/23/15 1:00 AM	9.4	-174.54	0.0191	S1-4
5/23/15 2:00 AM	8.6	-167.41	0.0191	S1-4
5/23/15 3:00 AM	7.5	-146.06	0.0191	S1-4
5/23/15 4:00 AM	7.0	-107.38	0.0191	S1-4
5/23/15 5:00 AM	6.8	-54.10	0.0191	S1-4
5/23/15 6:00 AM	6.9	8.17	0.1077	S1-4
5/22/15 8:00 PM	12.5	-78.07	0.3068	S2-5
5/22/15 9:00 PM	12.8	-146.97	0.3348	S2-5
5/22/15 10:00 PM	13.0	-206.01	0.3365	S2-5
5/22/15 11:00 PM	12.8	-246.40	0.2845	S2-5
5/23/15 12:00 AM	12.0	-228.85	0.1316	S2-5
5/23/15 1:00 AM	11.0	-221.31	0.1020	S2-5
5/23/15 2:00 AM	10.5	-255.28	0.2557	S2-5
5/23/15 3:00 AM	8.7	-215.00	0.2115	S2-5

5/23/15 4:00 AM	7.5	-156.87	0.1902	S2-5
5/23/15 5:00 AM	8.0	-80.09	0.3124	S2-5
5/23/15 6:00 AM	8.9	16.01	0.4304	S2-5
5/22/15 8:00 PM	9.6			S2-1R
5/22/15 9:00 PM	9.5			S2-1R
5/22/15 10:00 PM	9.7			S2-1R
5/22/15 11:00 PM	9.6			S2-1R
5/23/15 12:00 AM	9.0			S2-1R
5/23/15 1:00 AM	8.1			S2-1R
5/23/15 2:00 AM	7.7			S2-1R
5/23/15 3:00 AM	6.7			S2-1R
5/23/15 4:00 AM	5.6			S2-1R
5/23/15 5:00 AM	6.0			S2-1R
5/23/15 6:00 AM	6.5			S2-1R
5/22/15 8:00 PM	12.5	-69.34	0.1468	S2-2
5/22/15 9:00 PM	12.8	-130.85	0.1542	S2-2
5/22/15 10:00 PM	13.0	-183.19	0.1561	S2-2
5/22/15 11:00 PM	12.8	-220.58	0.1501	S2-2
5/23/15 12:00 AM	12.0	-226.28	0.1042	S2-2
5/23/15 1:00 AM	11.0	-218.82	0.0806	S2-2
5/23/15 2:00 AM	10.5	-239.62	0.1601	S2-2
5/23/15 3:00 AM	8.7	-214.78	0.1751	S2-2
5/23/15 4:00 AM	7.5	-160.59	0.1758	S2-2
5/23/15 5:00 AM	8.0	-74.60	0.1532	S2-2
5/23/15 6:00 AM	8.9	15.20	0.2076	S2-2
5/22/15 8:00 PM	12.5	-69.57	0.1349	S2-3
5/22/15 9:00 PM	12.8	-124.07	0.1160	S2-3
5/22/15 10:00 PM	13.0	-168.45	0.1034	S2-3
5/22/15 11:00 PM	12.8	-208.88	0.1097	S2-3
5/23/15 12:00 AM	12.0	-237.99	0.1174	S2-3
5/23/15 1:00 AM	11.0	-240.07	0.1096	S2-3
5/23/15 2:00 AM	10.5	-240.40	0.1478	S2-3
5/23/15 3:00 AM	8.7	-221.74	0.1849	S2-3
5/23/15 4:00 AM	7.5	-171.83	0.2205	S2-3
5/23/15 5:00 AM	8.0	-78.91	0.1799	S2-3
5/23/15 6:00 AM	8.9	15.41	0.2150	S2-3
5/22/15 8:00 PM	12.5	-74.81	0.1578	S2-4
5/22/15 9:00 PM	12.8	-131.68	0.1353	S2-4
5/22/15 10:00 PM	13.0	-179.26	0.1233	S2-4
5/22/15 11:00 PM	12.8	-222.30	0.1328	S2-4
5/23/15 12:00 AM	12.0	-259.16	0.1587	S2-4
5/23/15 1:00 AM	11.0	-269.63	0.1694	S2-4
5/23/15 2:00 AM	10.5	-253.22	0.1756	S2-4
5/23/15 3:00 AM	8.7	-230.29	0.2094	S2-4
5/23/15 4:00 AM	7.5	-178.51	0.2528	S2-4
5/23/15 5:00 AM	8.0	-82.49	0.2099	S2-4
5/23/15 6:00 AM	8.9	15.77	0.2526	S2-4
5/22/15 8:00 PM	10.0			S3
5/22/15 9:00 PM	9.0			S3
5/22/15 10:00 PM	9.5			S3
5/22/15 11:00 PM	9.4			S3
5/23/15 12:00 AM	9.1			S3
5/23/15 1:00 AM	8.2			S3
5/23/15 2:00 AM	7.5			S3
5/23/15 3:00 AM	6.5			S3
5/23/15 4:00 AM	6.2			S3
5/23/15 5:00 AM	5.6			S3

5/23/15 6:00 AM	5.8			S3
5/22/15 8:00 PM	9.6			S4
5/22/15 9:00 PM	9.2			S4
5/22/15 10:00 PM	9.3			S4
5/22/15 11:00 PM	9.4			S4
5/23/15 12:00 AM	9.3			S4
5/23/15 1:00 AM	8.5			S4
5/23/15 2:00 AM	7.9			S4
5/23/15 3:00 AM	6.7			S4
5/23/15 4:00 AM	6.2			S4
5/23/15 5:00 AM	6.0			S4
5/23/15 6:00 AM	6.3			S4
5/22/15 8:00 PM	8.8	-49.43	0.0313	S5-5
5/22/15 9:00 PM	9.6	-96.18	0.0368	S5-5
5/22/15 10:00 PM	8.9	-157.09	0.0697	S5-5
5/22/15 11:00 PM	8.6	-176.98	0.0461	S5-5
5/23/15 12:00 AM	8.3	-186.27	0.0283	S5-5
5/23/15 1:00 AM	7.8	-194.23	0.0304	S5-5
5/23/15 2:00 AM	7.0	-205.03	0.0630	S5-5
5/23/15 3:00 AM	6.6	-181.00	0.0717	S5-5
5/23/15 4:00 AM	6.4	-138.71	0.0909	S5-5
5/23/15 5:00 AM	6.0	-63.67	0.0499	S5-5
5/23/15 6:00 AM	6.2	3.63	0.0834	S5-5
5/22/15 8:00 PM	8.8	-76.78	0.0975	S5-2
5/22/15 9:00 PM	9.6	-115.27	0.0651	S5-2
5/22/15 10:00 PM	8.9	-163.31	0.0673	S5-2
5/22/15 11:00 PM	8.6	-195.78	0.0615	S5-2
5/23/15 12:00 AM	8.3	-205.22	0.0435	S5-2
5/23/15 1:00 AM	7.8	-212.39	0.0448	S5-2
5/23/15 2:00 AM	7.0	-235.75	0.0990	S5-2
5/23/15 3:00 AM	6.6	-220.28	0.1461	S5-2
5/23/15 4:00 AM	6.4	-165.18	0.1655	S5-2
5/23/15 5:00 AM	6.0	-78.61	0.1040	S5-2
5/23/15 6:00 AM	6.2	1.27	0.0967	S5-2
5/22/15 8:00 PM	8.8	-86.02	0.1186	S5-3
5/22/15 9:00 PM	9.6	-131.09	0.0917	S5-3
5/22/15 10:00 PM	8.9	-170.39	0.0716	S5-3
5/22/15 11:00 PM	8.6	-221.65	0.0916	S5-3
5/23/15 12:00 AM	8.3	-268.50	0.1312	S5-3
5/23/15 1:00 AM	7.8	-280.09	0.1452	S5-3
5/23/15 2:00 AM	7.0	-261.02	0.1386	S5-3
5/23/15 3:00 AM	6.6	-238.86	0.1924	S5-3
5/23/15 4:00 AM	6.4	-180.46	0.2295	S5-3
5/23/15 5:00 AM	6.0	-89.28	0.1597	S5-3
5/23/15 6:00 AM	6.2	-2.19	0.1284	S5-3
5/22/15 8:00 PM	8.8	-93.93	0.1405	S5-4
5/22/15 9:00 PM	9.6	-142.92	0.1144	S5-4
5/22/15 10:00 PM	8.9	-182.77	0.0865	S5-4
5/22/15 11:00 PM	8.6	-233.47	0.1049	S5-4
5/23/15 12:00 AM	8.3	-287.30	0.1641	S5-4
5/23/15 1:00 AM	7.8	-301.13	0.1889	S5-4
5/23/15 2:00 AM	7.0	-275.83	0.1658	S5-4
5/23/15 3:00 AM	6.6	-246.60	0.2117	S5-4
5/23/15 4:00 AM	6.4	-186.80	0.2591	S5-4
5/23/15 5:00 AM	6.0	-95.02	0.1981	S5-4
5/23/15 6:00 AM	6.2	-4.68	0.1667	S5-4

5/22/15 8:00 PM	9.1			S6
5/22/15 9:00 PM	8.7			S6
5/22/15 10:00 PM	9.1			S6
5/22/15 11:00 PM	9.0			S6
5/23/15 12:00 AM	8.7			S6
5/23/15 1:00 AM	8.1			S6
5/23/15 2:00 AM	7.4			S6
5/23/15 3:00 AM	6.5			S6
5/23/15 4:00 AM	5.8			S6
5/23/15 5:00 AM	5.8			S6
5/23/15 6:00 AM	6.1			S6
5/22/15 8:00 PM				S7
5/22/15 9:00 PM				S7
5/22/15 10:00 PM				S7
5/22/15 11:00 PM				S7
5/23/15 12:00 AM				S7
5/23/15 1:00 AM				S7
5/23/15 2:00 AM				S7
5/23/15 3:00 AM				S7
5/23/15 4:00 AM				S7
5/23/15 5:00 AM				S7
5/23/15 6:00 AM				S7

DE09

t	d.rhove.w.v	H	ustar	sample point
date	[g/m^3]	[W/m^2]	[m/s]	
5/23/15 7:50 AM	7.7	93.61	0.2988	S1-5
5/23/15 8:50 AM	7.4	117.65	0.3624	S1-5
5/23/15 9:50 AM	7.3	144.60	0.2778	S1-5
5/23/15 10:50 AM	7.7	159.78	0.2544	S1-5
5/23/15 11:50 AM	7.5	163.71	0.2488	S1-5
5/23/15 12:50 PM	8.4	161.53	0.2636	S1-5
5/23/15 1:50 PM	8.7	145.12	0.2456	S1-5
5/23/15 2:50 PM	9.1	120.31	0.2771	S1-5
5/23/15 3:50 PM	9.0	91.02	0.2726	S1-5
5/23/15 7:50 AM	7.7	99.92	0.0223	S1-2
5/23/15 8:50 AM	7.4	129.94	0.0223	S1-2
5/23/15 9:50 AM	7.3	153.22	0.0223	S1-2
5/23/15 10:50 AM	7.7	166.19	0.0223	S1-2
5/23/15 11:50 AM	7.5	170.74	0.0223	S1-2
5/23/15 12:50 PM	8.4	167.36	0.0223	S1-2
5/23/15 1:50 PM	8.7	153.36	0.0223	S1-2
5/23/15 2:50 PM	9.1	133.95	0.0223	S1-2
5/23/15 3:50 PM	9.0	109.76	0.0223	S1-2
5/23/15 7:50 AM	7.7	90.34	0.3380	S1-3
5/23/15 8:50 AM	7.4	111.23	0.4189	S1-3
5/23/15 9:50 AM	7.3	138.73	0.3367	S1-3
5/23/15 10:50 AM	7.7	155.68	0.2958	S1-3
5/23/15 11:50 AM	7.5	161.41	0.2410	S1-3
5/23/15 12:50 PM	8.4	160.18	0.2450	S1-3
5/23/15 1:50 PM	8.7	139.79	0.2839	S1-3
5/23/15 2:50 PM	9.1	115.40	0.2855	S1-3
5/23/15 3:50 PM	9.0	86.25	0.2616	S1-3
5/23/15 7:50 AM	7.7	99.92	0.0191	S1-4
5/23/15 8:50 AM	7.4	129.94	0.0191	S1-4
5/23/15 9:50 AM	7.3	153.22	0.0191	S1-4
5/23/15 10:50 AM	7.7	166.19	0.0191	S1-4
5/23/15 11:50 AM	7.5	170.74	0.0191	S1-4

5/23/15 12:50 PM	8.4	167.36	0.0191	S1-4
5/23/15 1:50 PM	8.7	153.36	0.0191	S1-4
5/23/15 2:50 PM	9.1	133.95	0.0191	S1-4
5/23/15 3:50 PM	9.0	109.76	0.0191	S1-4
5/23/15 7:50 AM	10.1	90.58	0.4422	S2-5
5/23/15 8:50 AM	8.8	95.36	0.4476	S2-5
5/23/15 9:50 AM	8.8	115.12	0.3975	S2-5
5/23/15 10:50 AM	8.8	128.99	0.3550	S2-5
5/23/15 11:50 AM	8.7	141.81	0.3345	S2-5
5/23/15 12:50 PM	9.3	141.77	0.2965	S2-5
5/23/15 1:50 PM	9.8	124.35	0.3317	S2-5
5/23/15 2:50 PM	9.8	105.25	0.2907	S2-5
5/23/15 3:50 PM	9.6	74.48	0.2935	S2-5
5/23/15 7:50 AM	7.7			S2-1R
5/23/15 8:50 AM	6.6			S2-1R
5/23/15 9:50 AM	6.5			S2-1R
5/23/15 10:50 AM	6.7			S2-1R
5/23/15 11:50 AM	7.3			S2-1R
5/23/15 12:50 PM	8.2			S2-1R
5/23/15 1:50 PM	8.4			S2-1R
5/23/15 2:50 PM	9.3			S2-1R
5/23/15 3:50 PM	9.2			S2-1R
5/23/15 7:50 AM	10.1	90.96	0.3134	S2-2
5/23/15 8:50 AM	8.8	94.62	0.3795	S2-2
5/23/15 9:50 AM	8.8	115.35	0.3272	S2-2
5/23/15 10:50 AM	8.8	129.97	0.2903	S2-2
5/23/15 11:50 AM	8.7	143.33	0.2670	S2-2
5/23/15 12:50 PM	9.3	142.79	0.2394	S2-2
5/23/15 1:50 PM	9.8	125.83	0.2666	S2-2
5/23/15 2:50 PM	9.8	105.10	0.2552	S2-2
5/23/15 3:50 PM	9.6	76.42	0.2379	S2-2
5/23/15 7:50 AM	10.1	90.75	0.3125	S2-3
5/23/15 8:50 AM	8.8	91.82	0.3926	S2-3
5/23/15 9:50 AM	8.8	114.33	0.3210	S2-3
5/23/15 10:50 AM	8.8	129.67	0.2776	S2-3
5/23/15 11:50 AM	8.7	144.79	0.2299	S2-3
5/23/15 12:50 PM	9.3	143.20	0.2247	S2-3
5/23/15 1:50 PM	9.8	125.61	0.2491	S2-3
5/23/15 2:50 PM	9.8	104.04	0.2510	S2-3
5/23/15 3:50 PM	9.6	76.77	0.2182	S2-3
5/23/15 7:50 AM	10.1	90.39	0.3396	S2-4
5/23/15 8:50 AM	8.8	88.63	0.4232	S2-4
5/23/15 9:50 AM	8.8	112.41	0.3325	S2-4
5/23/15 10:50 AM	8.8	128.47	0.2823	S2-4
5/23/15 11:50 AM	8.7	144.47	0.2278	S2-4
5/23/15 12:50 PM	9.3	142.37	0.2300	S2-4
5/23/15 1:50 PM	9.8	124.07	0.2587	S2-4
5/23/15 2:50 PM	9.8	101.43	0.2648	S2-4
5/23/15 3:50 PM	9.6	73.47	0.2351	S2-4
5/23/15 7:50 AM	8.4			S3
5/23/15 8:50 AM	7.0			S3
5/23/15 9:50 AM	6.9			S3
5/23/15 10:50 AM	7.0			S3
5/23/15 11:50 AM	7.7			S3
5/23/15 12:50 PM	8.2			S3
5/23/15 1:50 PM	8.5			S3

5/23/15 2:50 PM	9.0			S3
5/23/15 3:50 PM	9.0			S3
5/23/15 7:50 AM	8.1			S4
5/23/15 8:50 AM	6.6			S4
5/23/15 9:50 AM	6.6			S4
5/23/15 10:50 AM	6.8			S4
5/23/15 11:50 AM	7.5			S4
5/23/15 12:50 PM	7.9			S4
5/23/15 1:50 PM	7.8			S4
5/23/15 2:50 PM	8.2			S4
5/23/15 3:50 PM	8.1			S4
5/23/15 7:50 AM	7.4	68.59	0.2066	S5-5
5/23/15 8:50 AM	6.4	82.96	0.3217	S5-5
5/23/15 9:50 AM	7.3	112.57	0.2508	S5-5
5/23/15 10:50 AM	8.4	129.01	0.1762	S5-5
5/23/15 11:50 AM	9.2	131.62	0.1948	S5-5
5/23/15 12:50 PM	8.6	135.60	0.1662	S5-5
5/23/15 1:50 PM	8.3	124.18	0.2339	S5-5
5/23/15 2:50 PM	8.4	107.16	0.1615	S5-5
5/23/15 3:50 PM	8.4	87.67	0.1440	S5-5
5/23/15 7:50 AM	7.4	59.85	0.2449	S5-2
5/23/15 8:50 AM	6.4	73.95	0.3428	S5-2
5/23/15 9:50 AM	7.3	104.30	0.2879	S5-2
5/23/15 10:50 AM	8.4	118.86	0.2544	S5-2
5/23/15 11:50 AM	9.2	127.37	0.2160	S5-2
5/23/15 12:50 PM	8.6	129.40	0.2023	S5-2
5/23/15 1:50 PM	8.3	121.60	0.2258	S5-2
5/23/15 2:50 PM	8.4	98.51	0.2011	S5-2
5/23/15 3:50 PM	8.4	75.48	0.1856	S5-2
5/23/15 7:50 AM	7.4	52.53	0.2856	S5-3
5/23/15 8:50 AM	6.4	65.17	0.3852	S5-3
5/23/15 9:50 AM	7.3	98.63	0.3151	S5-3
5/23/15 10:50 AM	8.4	114.99	0.2731	S5-3
5/23/15 11:50 AM	9.2	124.73	0.2246	S5-3
5/23/15 12:50 PM	8.6	124.92	0.2267	S5-3
5/23/15 1:50 PM	8.3	117.34	0.2520	S5-3
5/23/15 2:50 PM	8.4	89.41	0.2489	S5-3
5/23/15 3:50 PM	8.4	64.51	0.2359	S5-3
5/23/15 7:50 AM	7.4	47.55	0.3123	S5-4
5/23/15 8:50 AM	6.4	59.76	0.4092	S5-4
5/23/15 9:50 AM	7.3	95.33	0.3288	S5-4
5/23/15 10:50 AM	8.4	113.34	0.2777	S5-4
5/23/15 11:50 AM	9.2	124.05	0.2287	S5-4
5/23/15 12:50 PM	8.6	123.79	0.2342	S5-4
5/23/15 1:50 PM	8.3	115.59	0.2585	S5-4
5/23/15 2:50 PM	8.4	85.40	0.2646	S5-4
5/23/15 3:50 PM	8.4	59.87	0.2502	S5-4
5/23/15 7:50 AM	7.5			S6
5/23/15 8:50 AM	6.8			S6
5/23/15 9:50 AM	6.6			S6
5/23/15 10:50 AM	6.5			S6
5/23/15 11:50 AM	7.4			S6
5/23/15 12:50 PM	7.2			S6
5/23/15 1:50 PM	6.9			S6
5/23/15 2:50 PM	7.0			S6
5/23/15 3:50 PM	6.7			S6

5/22/15 4:50 PM				S6
5/23/15 7:50 AM				S7
5/23/15 8:50 AM				S7
5/23/15 9:50 AM				S7
5/23/15 10:50 AM				S7
5/23/15 11:50 AM				S7
5/23/15 12:50 PM				S7
5/23/15 1:50 PM				S7
5/23/15 2:50 PM				S7
5/23/15 3:50 PM				S7

DE10

t	d.rhove.w.v	H	ustar	sample point
date	[g/m^3]	[W/m^2]	[m/s]	
5/24/15 8:05 AM	10.9	99.44	0.3282	S1-5
5/24/15 9:05 AM	11.7	120.23	0.3725	S1-5
5/24/15 10:05 AM	12.8	134.74	0.4230	S1-5
5/24/15 11:05 AM	13.3	140.69	0.3858	S1-5
5/24/15 12:05 PM	13.3	137.80	0.3519	S1-5
5/24/15 1:05 PM	14.0	126.24	0.4003	S1-5
5/24/15 8:05 AM	10.9	99.89	0.0223	S1-2
5/24/15 9:05 AM	11.7	121.94	0.0223	S1-2
5/24/15 10:05 AM	12.8	135.36	0.0223	S1-2
5/24/15 11:05 AM	13.3	142.10	0.0223	S1-2
5/24/15 12:05 PM	13.3	142.24	0.0223	S1-2
5/24/15 1:05 PM	14.0	134.80	0.0223	S1-2
5/24/15 8:05 AM	10.9	99.39	0.2860	S1-3
5/24/15 9:05 AM	11.7	119.80	0.3515	S1-3
5/24/15 10:05 AM	12.8	134.65	0.3703	S1-3
5/24/15 11:05 AM	13.3	140.42	0.3523	S1-3
5/24/15 12:05 PM	13.3	136.96	0.3233	S1-3
5/24/15 1:05 PM	14.0	124.41	0.3654	S1-3
5/24/15 8:05 AM	10.9	99.89	0.0191	S1-4
5/24/15 9:05 AM	11.7	121.94	0.0191	S1-4
5/24/15 10:05 AM	12.8	135.36	0.0191	S1-4
5/24/15 11:05 AM	13.3	142.10	0.0191	S1-4
5/24/15 12:05 PM	13.3	142.24	0.0191	S1-4
5/24/15 1:05 PM	14.0	134.80	0.0191	S1-4
5/24/15 8:05 AM	13.5	114.22	0.2911	S2-5
5/24/15 9:05 AM	14.3	121.75	0.3453	S2-5
5/24/15 10:05 AM	15.0	130.93	0.3648	S2-5
5/24/15 11:05 AM	15.1	134.52	0.3309	S2-5
5/24/15 12:05 PM	14.9	129.95	0.3050	S2-5
5/24/15 1:05 PM	15.4	125.13	0.3228	S2-5
5/24/15 8:05 AM	10.1			S2-1R
5/24/15 9:05 AM	10.8			S2-1R
5/24/15 10:05 AM	11.4			S2-1R
5/24/15 11:05 AM	11.4			S2-1R
5/24/15 12:05 PM	11.9			S2-1R
5/24/15 1:05 PM	12.8			S2-1R
5/24/15 8:05 AM	13.5	117.85	0.3062	S2-2
5/24/15 9:05 AM	14.3	122.99	0.3464	S2-2
5/24/15 10:05 AM	15.0	131.70	0.3587	S2-2
5/24/15 11:05 AM	15.1	134.79	0.3300	S2-2
5/24/15 12:05 PM	14.9	129.36	0.3073	S2-2

5/24/15 1:05 PM	15.4	124.29	0.3257	S2-2
5/24/15 8:05 AM	13.5	121.23	0.3373	S2-3
5/24/15 9:05 AM	14.3	124.19	0.3717	S2-3
5/24/15 10:05 AM	15.0	132.43	0.3785	S2-3
5/24/15 11:05 AM	15.1	135.07	0.3550	S2-3
5/24/15 12:05 PM	14.9	128.75	0.3276	S2-3
5/24/15 1:05 PM	15.4	123.36	0.3566	S2-3
5/24/15 8:05 AM	13.5	123.42	0.3568	S2-4
5/24/15 9:05 AM	14.3	124.99	0.3884	S2-4
5/24/15 10:05 AM	15.0	132.90	0.3904	S2-4
5/24/15 11:05 AM	15.1	135.25	0.3759	S2-4
5/24/15 12:05 PM	14.9	128.26	0.3462	S2-4
5/24/15 1:05 PM	15.4	122.65	0.3812	S2-4
5/24/15 8:05 AM	10.2			S3
5/24/15 9:05 AM	11.7			S3
5/24/15 10:05 AM	14.5			S3
5/24/15 11:05 AM	13.4			S3
5/24/15 12:05 PM	12.4			S3
5/24/15 1:05 PM	12.7			S3
5/24/15 8:05 AM	10.1			S4
5/24/15 9:05 AM	11.4			S4
5/24/15 10:05 AM	13.0			S4
5/24/15 11:05 AM	12.4			S4
5/24/15 12:05 PM	11.7			S4
5/24/15 1:05 PM	12.2			S4
5/24/15 8:05 AM	10.2	84.50	0.3548	S5-5
5/24/15 9:05 AM	11.8	95.46	0.4103	S5-5
5/24/15 10:05 AM	12.4	92.20	0.4600	S5-5
5/24/15 11:05 AM	13.0	92.97	0.4123	S5-5
5/24/15 12:05 PM	13.4	93.08	0.3705	S5-5
5/24/15 1:05 PM	13.2	93.66	0.3909	S5-5
5/24/15 8:05 AM	10.2	82.34	0.3523	S5-2
5/24/15 9:05 AM	11.8	92.86	0.3952	S5-2
5/24/15 10:05 AM	12.4	90.71	0.3984	S5-2
5/24/15 11:05 AM	13.0	89.65	0.3790	S5-2
5/24/15 12:05 PM	13.4	88.48	0.3573	S5-2
5/24/15 1:05 PM	13.2	89.70	0.3681	S5-2
5/24/15 8:05 AM	10.2	80.83	0.3615	S5-3
5/24/15 9:05 AM	11.8	90.99	0.4010	S5-3
5/24/15 10:05 AM	12.4	88.17	0.3992	S5-3
5/24/15 11:05 AM	13.0	86.31	0.3845	S5-3
5/24/15 12:05 PM	13.4	85.04	0.3621	S5-3
5/24/15 1:05 PM	13.2	85.51	0.3827	S5-3
5/24/15 8:05 AM	10.2	80.04	0.3631	S5-4
5/24/15 9:05 AM	11.8	90.11	0.3985	S5-4
5/24/15 10:05 AM	12.4	86.81	0.3968	S5-4
5/24/15 11:05 AM	13.0	84.76	0.3817	S5-4
5/24/15 12:05 PM	13.4	83.21	0.3618	S5-4
5/24/15 1:05 PM	13.2	82.84	0.3913	S5-4
5/24/15 8:05 AM	10.2			S6
5/24/15 9:05 AM	11.7			S6
5/24/15 10:05 AM	12.8			S6
5/24/15 11:05 AM	12.4			S6

5/24/15 12:05 PM	12.3	S6
5/24/15 1:05 PM	12.4	S6
5/24/15 8:05 AM		S7
5/24/15 9:05 AM		S7
5/24/15 10:05 AM		S7
5/24/15 11:05 AM		S7
5/24/15 12:05 PM		S7
5/24/15 1:05 PM		S7

Appendix C – Table of sampler names and experiment names

Sampler name	Reporting name
S1-5	T1-1
S1-2	T1-2
S1-3	T1-3
S1-4	T1-4
S2-1	T2-1
S2-1R	T2-1R
S2-2	T2-2
S2-3	T2-3
S2-4	T2-4
S3	S1
S4	S2
S5-1	T3-1
S5-2	T3-2
S5-3	T3-3
S5-4	T3-4
S6	S3
S7	S4
S8	S5: Background
Experiment name	Reporting name
DE01	N1
DE02	N2
DE03	D1
DE04	N3
DE05	D2
DE06	N4
DE07	D3
DE08	N5
DE09	D4
DE10	D5

Appendix D - Matlab coding

calculate_met.m:

```
function [Tk, esat, eact, D, slp, q, Cp, Lv, psy]=calculate_met(Tair, RH, P)
% [Tk, esat, eact, D, slp, q, Cp, Lv, psy]=calculate_met(Tair, RH, P)
% This function calculates a number of meteorological Variables. See Stull (2001)
for details
% regarding these calculations.
%
% Tair    Air temperature (C)
% RH      Relative humidity (%)
% P       Atmpheric Pressure (kPa)
%
% TK      Air temperature (K)
% esat    Saturation Water Vapor Pressure (kPa)
% eact    Actual Water Vapor Pressure (kPa)
% D       Water Vapor Pressure Deficit (kPa)
% slp     Slope of the Saturation Water Vapor Pressure - Temperature Curve(kPa/K)
% q       Specific Humidity (g/kg)
% Cp      Specific Heat (J/kgK)
% Lv      Latent Heat of Vaporization (J/kg)
% psy     Psychrometric Constant (kPa/K)

%%
%  JG Alfieri 9/18/15
%%
============================================================
==================================== %%
%% Calculaions
Tk=Tair+273.15;
esat = 0.6108.*exp(17.2694.*Tair./(237.3+Tair));
eact=esat.*RH/100;
D=esat-eact;
slp=((17.2694*237.3)./(Tair + 237.3).^2).*esat;
q=1000.*0.622.*eact./P;
Cp=1005.*(1 + 0.84.*q./1000);
Lv=(2500.8  -2.3668.*Tair).*1000;
psy=(Cp./Lv).*(P./0.622);
end
```

convert_excel_time.m

```
function  t=convert_excel_time(t_excel, cur_yr, tstp)
% t=convert_excel_time(t_excel, cyr, tstp)
% This function converts serial date/time from Excel to calendar date time. This
conversion is
```

```
% necessary because the pivot date used by Excel and Matlab differ. The function
also shifts the time
% from the end of the measurement period to the midpoint.
%
% t_excel  Time/Date as an Excel sequential number
% cur_yr   Current year
% tstp     Timestep of measurements (s)
%
% t        Matrix of time/date information structured as follows:
%          1 Year          2 Month              3 Day
%          4 Hour          5 Minute             6 Second
%          7 Decimal Time/Date   8 Day of Year          9 Time of Day

%%
%  JG Alfieri 9/18/15
%%
=============================================================
====================================== %%
%% Shift Pivot Data and Calculate Calendar Date & Time
N=length(t_excel);
tdec=t_excel-(datenum(cur_yr,1,1,0,0,0) - datenum(1900,1,1,0,0,0)) - tstp/172800;
[~,mon,day,hr,mn,sec] = datevec(tdec);
%% Generate Vector Representing the Year
yr=cur_yr.*ones(N,1);
%% Round Seconds to Nearest FULL Second
sec=round(sec);
%  If nearest full second is 60, set second to zero and add 1 to number of minutes
b=find(sec==60);
sec(b)=0; mn(b)=mn(b)+1;
%% Calculate Decimal Date and Time
doy=fix(tdec);
tod=(hr + mn./60 + sec./3600);
t=[yr mon day hr mn sec tdec doy tod];
end
```

deg2rad.m

```
function y=deg2rad(x)
y=x.*pi/180;
end
```

net_radiation.m

```
function Rn=net_radiation(des, zen, Tk, eact, alb, fclr, elev)
% Rn=net_radiation(des, zen, Tk, eact, alb, fclr, elev)
% This function models net radiation follow the simple approach outlined in FAO56.
%
% des     Relative distance between the earth and sun
```

```
% zen      Solar Zenith Angle (deg)
% TK       Air temperature (K)
% eact     Actual Water Vapor Pressure (kPa)
% alb      Albedo
% fclr     Clear Sky Fraction
% elev     Site Elevation (m)
%
% Rn       Net Radiation (w/m^2)

%%
% JG Alfieri 9/18/15
%%
==============================================================
====================================== %%
%% Define Constnants
% Sk          Solar Constant [W/m^2]
% sb          Stefan-Boltzmann Constant
Sk =1367.7;
sb=5.67e-8;
%% Calculate Radiation at the top of the atmosphere
Ktoa=Sk.*(1./des.^2).*(sind(zen(:,2)) - sind(zen(:,1)))./deg2rad(zen(:,2)-zen(:,1));
%% Calculate Net Shortwave Radiation
Kclr=Ktoa.*(0.75+0.00002*elev);
Kin=fclr.*Kclr;
Knet=Kin*(1-alb);
%% Calculate Net Longwave
Lnet=-sb.*((Tk).^4).*(0.34-0.14.*sqrt(eact)).*(1.35.*fclr-0.35);
%% Calculate Net Radiation
Rn=Knet+Lnet;
end
```

solar_position.m

```
function [des, zen]=solar_position(year, mon, day, tod, lat, lon, tzo, tstp)
% [des, zen]=solar_position(year, mon, day, tod, lat, lon, tzo, tstp)
% This function calculates the solar position and outputs the solar zenith angle and
earth/sun
% distance needed for subsequent calculations.
%
% year    Year
% mon     Month
% day     Day
% tod     Decimal time of day
% lat     Latitude
% lon     Logitude
% tzo     Time zone offset from GMT
% tstp    Time Step
```

```
%
%  des      Relative distance between the earth and sun
%  zen      Solar Zenith Angle (deg)


%%
%   JG Alfieri 9/18/15
%%
================================================================
===================================== %%
%%  Define Constants
%   Note: For simplicity of the calculations, the Julian Day and Century are
%   calculated relative to January 1, 2000. If solar times prior to this
%   date are desired, the constant, j2000 must be adjusted accordingly.
%   j2000          julian day for January 1, 2000
j2000=2451545;
%%  Calculate Julian Day and Century
%   Julian Day
ftod=tod./24;
if (mon(1)<=2); yr=year(1)-1; mn=mon(1)+12; else yr=year(1); mn=mon(1); end
tmp1=floor(yr/100); tmp2= 2 - tmp1 + floor(tmp1/4);
j1=floor(365.25*(yr + 4716)) + floor(30.6001*(mn+1)) + day + tmp2 - 1524.5;
j=j1 + ftod - tzo/24;
clear yr mn tmp1 tmp2
%  Julian Century
c=(j-j2000)/36525;
%%  Calculate the Geometric Mean Longitude and Anomaly of the Sun
% Note: These and all other angles are calculated in DEGREES
mlon= 280.46646 + c.*(36000.76983 + 0.0003032.*c);
mlon=mod(mlon, 360);
manm= 357.52911 + c.*(35999.05029 - 0.0001537.*c);
%%  Calculate the Eccentricity of the Earth's orbit
eeo=0.016708634 - c.*(0.000042037 + 0.0001537.*c);
%%  Calculate the Equation of Center for the Sun
tmp1=sind(manm); tmp2=sind(2.*manm); tmp3=sind(3.*manm);

eqc= tmp1.*(1.914602 - c.*(0.004817 + 0.000014.*c)) + ...
    tmp2.*(0.019993 - c.*0.000101) + tmp3.*0.000289;
clear tmp1 tmp2 tmp3
%%  Calculate True Longitude and Anomaly of the Sun
slon=mlon + eqc; sanm=manm + eqc;
%%  Calculate the Earth-Sun Distance
des= ((1.000001018.*(1 - eeo.^2))./(1 + eeo.*cosd(sanm)));
%%  Calculate Apparent Longitude of the Sun
tmp1=125.04 - 1934.136.*c;
alon=slon - 0.00569 - 0.00478.*sind(tmp1);
```

```
clear tmp1
%%  Calculate the Obliquity of the Elliptic
tmp1=21.448 - c.*(46.8150 + c.*(0.00059 - c.*(0.001813)));
tmp2=23 + (26 + (tmp1./60))./60;
tmp3=125.04 - 1934.136.*c;
oe = tmp2 + 0.00256.*cosd(tmp3);
clear tmp1 tmp2 tmp3
%%  Calculate Solar Declination
sdec=asind(sind(oe).*sind(alon));
%%  Calculate the Equation of Time
tmp0=tand(oe./2).^2;  tmp1=sind(2.*mlon);  tmp2=sind(   manm);
tmp3=cosd(2.*mlon);   tmp4=sind(4.*mlon);  tmp5=sind(2.*manm);
tmp6=  tmp0.*tmp1 - 2.*eeo.*tmp2 + 4.*eeo.*tmp0.*tmp2.*tmp3 ...
    - (tmp0.^2).*tmp4./2 - 5.*(eeo.^2).*tmp5./4;
eqt=4.*tmp6.*(180/pi);
clear tmp0 tmp1 tmp2 tmp3 tmp4 tmp5 tmp6
%%  Calculate the True Solar Time
tslr=mod(ftod.*1440 + eqt + 4*lon - 60*tzo, 1440);
%%  Calculate the Hour Angle for each time period during the day
ha=NaN.*tslr;
ha(tslr< 0)=(tslr(tslr< 0)/4) + 180;
ha(tslr>=0)=(tslr(tslr>=0)/4) - 180;

hae(:,1)=ha-tstp/480;
hae(:,2)=ha+tstp/480;
%% Calculate Solar Zenith
zen(:,1)=acosd(sind(lat).*sind(sdec) + cosd(lat).*cosd(sdec).*cosd(hae(:,1)));
zen(:,2)=acosd(sind(lat).*sind(sdec) + cosd(lat).*cosd(sdec).*cosd(hae(:,2)));
end
```

RefET_Script.m (Day)

```
%%  Calculstion of RefET
%   JG Alfieri 9/24/15  ZJ Yang modified 15/10/2015
%% Variable List
%   Cp            Specific heat (J/kgK)
%   D             Water vapor pressure deficit (kPa)
%   din           Temporary data input variable
%   des           Distance between the earth and sun
%   esat          Saturation water vapor pressure (kPa)
%   eact          Actual water vapor pressure (kPa)
%   G             Soil heat flux
%   H             Sensible heat flux
%   loc           Structure of site location information
%                 lat      Latitude (positive to North)
%                 lon      Longitude (positive to East)
%                 tzo      Time zone offset from GMT
```

```
%   LEo          Latent heat flux
%   Lv           Latent heat of vaporization (J/kg)
%   out          Matrix of outpur data
%   P            Atmospheric pressure (kPa)
%   psy          Psychrometric constant (kPa/K)
%   q            Specific humidity (g/kg)
%   RH           Relative humidity (%)
%   Rn           Net Radiation
%   slp          Slope of the saturation water vapor pressure - temperature curve
(kPa/K)
%   t            Matrix of date and time Information with the following columns:
%                1  Year     2  Month    3  Day
%                4  Hour     5  Minute   6  Second
%                7  Dec Time  8  DOY     9  TOD
%   TK           Air temperature (K)
%   Tair         Air Temperature (C)
%   t_excel      Date and time as Excel serial number
%   U            Wind speed (m/s)
%   zen          Solar zenith
%%  Prepare Work Space
clc; clear; close all
addpath('C:\Users\River Yang\Dropbox\MS project\Master thesis\Supporting
materials\NEW_model data\Final_Recalculate\02_HeatFlux\Coding\Day')
warning('off', 'MATLAB:xlswrite:AddSheet')
%%
==============================================================
====================================  %%
%%  !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!   USER
INPUTS    !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!  %%
%%
==============================================================
====================================  %%
%%  I/O
%   io           Structure of input/output information
%                ipath    Directory path to input data file (Note: Concluding "\" is
needed.)
%                iname    File name for input data file
%                isht     Worksheet name for input data
%                irng1    Data range for the site location (lat; lon, and tzo)
%                irng2    Data range for the input data
%                opath    Directory path to output data file (Note: Concluding "\" is
needed.)
%                oname    File name for output data file
%                osht     Worksheet name containing output fitting statistics
io.ipath='D:\Dropbox\MS project\Master thesis\Supporting materials\NEW_model
data\Final_Recalculate\02_HeatFlux\Input\';
```

```
io.iname='DE201409_09_day';
io.isht ='Sheet1';
io.irng1='A2:D2';
io.irng2='A5:E450';
io.opath='D:\Dropbox\MS project\Master thesis\Supporting materials\NEW_model
data\Final_Recalculate\03_FrictionVelosity\Input\';
io.oname='HeatFlux_DE201409_09_Input.xlsx';
io.osht ='RefET Results';
%%  Processing
%  alb           Albedo
%  cur_yr          Current year
%  fclr          Clear sky fraction
%  fG             fraction of net radiation conducted into the ground
%  tstp           Timestep of measurements (s)
alb=0.23;
cur_yr=2014;
fclr=0.95;
fG=0.10;
tstp=3600;
%%
============================================================
====================================  %%
%%  Read In and Extract Data
%%  Read in Site Location
din=xlsread([io.ipath, io.iname], io.isht, io.irng1, 'basic');
loc.lat=din(1); loc.lon=din(2); loc.tzo=din(3); loc. elev=din(4); clear din
%%  Read in Data
din=xlsread([io.ipath, io.iname], io.isht, io.irng2, 'basic');
t_excel=din(:,1);
U      =din(:,2);
Tair   =din(:,3);
RH     =din(:,4);
P      =din(:,5); clear din
%%
============================================================
====================================  %%
%%  Preliminary Calculations
%%  Calculate Date & Time
%  The function 'convert_excel_time' converts serial date/time from Excel to calendar
date time; it also
%  shifts the time from the end of the measurement period to the midpoint.
t=convert_excel_time(t_excel, cur_yr, tstp);
clear t_excel cur_yr
%%  Calculate Meteorological Quantities
[Tk, esat, eact, D, slp, q, Cp, Lv, psy]=calculate_met(Tair, RH, P);
```

```
%%
==========================================================================================================
==================================== %%
%% Model Net Radiation
[des, zen]=solar_position(t(:,1),t(:,2),t(:,3),t(:,9),loc.lat,loc.lon,loc.tzo,tstp);
Rn=net_radiation(des, zen, Tk, eact, alb, fclr, loc.elev);
clear des zen alb fclr
%% Model Soil Heat Flux
G=fG*Rn;
clear fG
%% Calculate Reference ET
%% Define Constants
%   Cn          Numerator Constant
%   Cd          Denominator Constant
%   These constants are those defined for use with the ASCE Standardized Reference
ET
%   W2MJhr      Conversion factor to convert W to MJ/hr
Cn=37;
Cd=0.24;
W2MJhr=0.0036;
%% Calculate Latent Heat Flux
trm_1=slp.*(W2MJhr*(Rn - G))./(Lv./1e6);
trm_2=psy.*(Cn./Tk).*U.*D;
trm_3=slp + psy.*(1+Cd.*U);
LEo=(Lv/tstp).*(trm_1+trm_2)./trm_3;
clear Cn Cd W2MJhr trm_1 trm_2 trm_3 Cp D Lv Tk eact esat psy q slp tstp loc
%% Calculate Sensible Heat Flux as Residual
H=Rn-G-LEo;
%%
==========================================================================================================
==================================== %%
%% Output Results
%% Define Constants
hdr.a={'Year', 'Mon', 'Day', 'Hr', 'Min', 'Sec', 'tDEC', 'DOY', 'TOD', ...
    'Wind Spd', 'Tair', 'RH', 'P', 'Rn', 'G', 'H', 'LE'};
hdr.b={'[m/s]', '[C]', '[%]', '[kPa]', '[W/m^2]', '[W/m^2]', '[W/m^2]', '[W/m^2]'};
%% Prepare Output
out=round(100.*[Rn G H LEo])./100;
out=[t U Tair RH P out];
clear t U Tair RH P Rn G H LEo
%% Save Results
xlswrite([io.opath, io.oname], hdr.a,  io.osht, 'A2');
xlswrite([io.opath, io.oname], hdr.b,  io.osht, 'J3');
xlswrite([io.opath, io.oname], out  ,  io.osht, 'A4');
clear
%%
```

RefET_Script.m (Night)

```
%%  Calculstion of RefET
%   JG Alfieri 9/24/15   ZJ Yang modified 15/10/2015
%% Variable List
%   Cp          Specific heat (J/kgK)
%   D           Water vapor pressure deficit (kPa)
%   din         Temporary data input variable
%   des         Distance between the earth and sun
%   esat        Saturation water vapor pressure (kPa)
%   eact        Actual water vapor pressure (kPa)
%   G           Soil heat flux
%   H           Sensible heat flux
%   loc         Structure of site location information
%               lat     Latitude (positive to North)
%               lon     Longitude (positive to East)
%               tzo     Time zone offset from GMT
%   LEo         Latent heat flux
%   Lv          Latent heat of vaporization (J/kg)
%   out         Matrix of outpur data
%   P           Atmospheric pressure (kPa)
%   psy         Psychrometric constant (kPa/K)
%   q           Specific humidity (g/kg)
%   RH          Relative humidity (%)
%   Rn          Net Radiation
%   slp         Slope of the saturation water vapor pressure - temperature curve
(kPa/K)
%   t           Matrix of date and time Information with the following columns:
%               1  Year     2  Month    3  Day
%               4  Hour     5  Minute   6  Second
%               7  Dec Time  8  DOY     9  TOD
%   TK          Air temperature (K)
%   Tair        Air Temperature (C)
%   t_excel     Date and time as Excel serial number
%   U           Wind speed (m/s)
%   zen         Solar zenith
%%  Prepare Work Space
clc; clear; close all
addpath('C:\Users\River Yang\Dropbox\MS project\Master thesis\Supporting
materials\NEW_model data\Final_Recalculate\02_HeatFlux\Coding\Night')
warning('off', 'MATLAB:xlswrite:AddSheet')
%%
============================================================
====================================  %%
```

```
%% !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!  USER
INPUTS  !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! %%
%%
==============================================================
==================================== %%
%% I/O
% io          Structure of input/output information
%               ipath   Directory path to input data file (Note: Concluding "\" is
needed.)
%               iname   File name for input data file
%               isht    Worksheet name for input data
%               irng1   Data range for the site location (lat; lon, and tzo)
%               irng2   Data range for the input data
%               opath   Directory path to output data file (Note: Concluding "\" is
needed.)
%               oname   File name for output data file
%               osht    Worksheet name containing output fitting statistics
io.ipath='D:\Dropbox\MS project\Master thesis\Supporting materials\NEW_model
data\Final_Recalculate\02_HeatFlux\Input\';
io.iname='DE201409_10_night.xlsx';
io.isht ='Sheet1';
io.irng1='A2:D2';
io.irng2='A5:E450';
io.opath='D:\Dropbox\MS project\Master thesis\Supporting materials\NEW_model
data\Final_Recalculate\03_FrictionVelosity\Input\';
io.oname='HeatFlux_DE201409_10_Input.xlsx';
io.osht ='RefET Results';
%% Processing
% alb         Albedo
% cur_yr        Current year
% fclr        Clear sky fraction
% fG          fraction of net radiation conducted into the ground
% tstp        Timestep of measurements (s)
alb=0.23;
cur_yr=2014;
fclr=0.95;
fG=0.10;
tstp=3600;
%%
==============================================================
==================================== %%
%% Read In and Extract Data
%% Read in Site Location
din=xlsread([io.ipath, io.iname], io.isht, io.irng1, 'basic');
loc.lat=din(1); loc.lon=din(2); loc.tzo=din(3); loc. elev=din(4); clear din
%% Read in Data
```

```
din=xlsread([io.ipath, io.iname], io.isht, io.irng2, 'basic');
t_excel=din(:,1);
U      =din(:,2);
Tair   =din(:,3);
RH     =din(:,4);
P      =din(:,5); clear din
%%
============================================================
==================================== %%
%%  Preliminary Calculations
%%  Calculate Date & Time
%  The function 'convert_excel_time' converts serial date/time from Excel to calendar
date time; it also
%  shifts the time from the end of the measurement period to the midpoint.
t=convert_excel_time(t_excel, cur_yr, tstp);
clear t_excel cur_yr
%%  Calculate Meteorological Quantities
[Tk, esat, eact, D, slp, q, Cp, Lv, psy]=calculate_met(Tair, RH, P);
%%
============================================================
==================================== %%
%%  Model Net Radiation
[des, zen]=solar_position(t(:,1),t(:,2),t(:,3),t(:,9),loc.lat,loc.lon,loc.tzo,tstp);
Rn=net_radiation(des, zen, Tk, eact, alb, fclr, loc.elev);
clear des zen alb fclr
%%  Model Soil Heat Flux
G=fG*Rn;
clear fG
%%  Calculate Reference ET
%%  Define Constants
%   Cn          Numerator Constant
%   Cd          Denominator Constant
%   These constants are those defined for use with the ASCE Standardized Reference
ET
%   W2MJhr        Conversion factor to convert W to MJ/hr
Cn=37;
Cd=0.96;
W2MJhr=0.0036;
%%  Calculate Latent Heat Flux
trm_1=slp.*(W2MJhr*(Rn - G))./(Lv./1e6);
trm_2=psy.*(Cn./Tk).*U.*D;
trm_3=slp + psy.*(1+Cd.*U);
LEo=(Lv/tstp).*(trm_1+trm_2)./trm_3;
clear Cn Cd W2MJhr trm_1 trm_2 trm_3 Cp D Lv Tk eact esat psy q slp tstp loc
%%  Calculate Sensible Heat Flux as Residual
H=Rn-G-LEo;
```

```
%%
================================================================
======================================  %%
%%  Output Results
%%  Define Constants
hdr.a={'Year', 'Mon', 'Day', 'Hr', 'Min', 'Sec', 'tDEC', 'DOY', 'TOD', ...
    'Wind Spd', 'Tair', 'RH', 'P', 'Rn', 'G', 'H', 'LE'};
hdr.b={'[m/s]', '[C]', '[%]', '[kPa]', '[W/m^2]', '[W/m^2]', '[W/m^2]', '[W/m^2]'};
%%  Prepare Output
out=round(100.*[Rn G H LEo])./100;
out=[t U Tair RH P out];
clear t U Tair RH P Rn G H LEo
%%  Save Results
xlswrite([io.opath, io.oname], hdr.a,  io.osht, 'A2');
xlswrite([io.opath, io.oname], hdr.b,  io.osht, 'J3');
xlswrite([io.opath, io.oname], out  ,  io.osht, 'A4');
clear
%%
```

FrictionVelocity_v2.m

```
%%  Prepare Work Space
clc; clear; close all
warning('off', 'MATLAB:xlswrite:AddSheet')
%%
================================================================
======================================  %%
%%  !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!   USER
INPUTS    !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!  %%
%%
================================================================
======================================  %%
%%  I/O
%   io          Structure of input/output information
%               ipath    Directory path to input data file (Note: Concluding "\" is
needed.)
%               iname    File name for input data file
%               isht     Worksheet name for input data
%               irng     Data range for the input data
%               opath    Directory path to output data file (Note: Concluding "\" is
needed.)
%               oname    File name for output data file
%               osht     Worksheet name containing output fitting statistics
io.ipath='D:\Dropbox\MS project\Master thesis\Supporting materials\NEW_model
data\Final_Recalculate\03_FrictionVelosity\Input\';
io.iname='HeatFlux_DE201409_10_Input.xlsx';
io.isht ='RefET Results';
```

```
io.irng ='A3:R450';
io.opath='D:\Dropbox\MS project\Master thesis\Supporting materials\NEW_model
data\Final_Recalculate\04_PlumeConcentration\Input\';
io.oname='FrictionVelocity_DE201409_10.xlsx';
io.osht ='Data';
%% Processing
% itr_max       Maximum Number of Iterations
% tol_max       Tolerance Threshold
% zo            Roughness Length for Momentum (m)
itr_max=7;
tol_max=5;
zo=0.10;
%%
============================================================
=================================== %%
%% Read In and Extract Data
% d             Matrix of Data and Time Data
%               1 Year          2 Month         3 Day
%               4 Hour          5 Minute        6 Second
%               7 Decimal Time    8 Day of Year     9 Time of Day
% G             Modeled Soil Heat Flux [W/m^2]
% H             Modeled Sensible Heat Flux [W/m^2]
% LE            Modeled Latent Heat Flux [W/m^2]
% Nprd          Number of Records
% P             Pressure [kPa]
% RH            Relative Humidity [%]
% Rn            Net Radiation [W/m^2]
% Tair          Air Temperature [C]
% U             Wind Speed [m/s]
% zm            Measurement Height [m]

din=xlsread([io.ipath, io.iname], io.isht, io.irng, 'basic');
dt=din(:,1:9);

U   =din(:,10);    Tair=din(:,11);    RH  =din(:,12);    P   =din(:,13);
Rn  =din(:,14);    G   =din(:,15);    H   =din(:,16);    LE  =din(:,17);
zm  =din(:,18);    clear din
Nprd=length(U);
%% Calculate Meteorological Quantities
% Cp            Specific Heat (J/kgK)
% D             Water Vapor Pressure Deficit (kPa)
% esat          Saturation Water Vapor Pressure (kPa)
% eact          Actual Water Vapor Pressure (kPa)
% Lv            Latent Heat of Vaporization (J/kg)
% psy           Psychrometric Constant (kPa/K)
% q             Specific Humidity (g/kg)
```

```
%   r              Mixing Ratio [g/kg]
%   rhoa           Air Density [kg/m^3)
%   RH             Relative humidity (%)
%   slp            Slope of the Saturation Water Vapor Pressure - Temperature
Curve(kPa/K)
%   TK             Air temperature (K)
%   Tpot           Potential Temperature (K)
%   Tv             Virtual Potential Temperatue (K)

esat = 0.6108.*exp(17.2694.*Tair./(237.3+Tair));
eact=esat.*RH/100;
D=esat-eact;
q=1000.*0.622.*eact./P;
r=1000.*0.622.*eact./(P-eact);
Cp=1005.*(1 + 0.84.*q./1000);
Tk=Tair+273.15;
Tpot=Tk.*(100./P).^(287.05./Cp);
Tv=Tpot.*(1+0.61.*r./1000);
rhoa=1000.*((P-eact)./(287.06.*Tk) + eact./(461.5.*Tk));
Lv=(2500.8  -2.3668.*Tair).*1000;
slp=((17.2694*237.3)./(Tair + 237.3).^2).*esat;
psy=(Cp./Lv).*(P./0.622);
%%  Estimate Friction Velocity
%%  Initial Estimate of Friction Velocity
%   L_0            Initial Estimate of Obukhov Length [m]
%   ustar_0        Initial Estimate of Friction Velocity (m/s)
%   zeta_0         Initial Estimate of Stability
ustar_0=0.4.*U./log(zm./zo);
L_0=-((ustar_0.^3).*Tv)./(9.81.*0.4.*(H./(rhoa.*Cp)));
zeta_0=zm./L_0;
%%  Begin Loop
ustar=NaN(Nprd,1);

for i=1:Nprd
   %%  Set Initial Estimates
   cLo=L_0(i);
   cuo=ustar_0(i);
   czo=zeta_0(i);
   %%  Conduct Iterative Calculation
   icnt=0;
   cflg=1;

   while (cflg==1)
      icnt=icnt+1;
      %%  Test If Stable z/L is within Valid Range
      if (czo>=0.2)
```

```
            ustar(i)=0.4*U(i)/(log(zm(i)./zo)+1);
            clear cLo cuo czo
            cflg=0;
        else
            %%  Calculate Psi
            if (czo>=0)
                psi=-5*czo;
                clear czo
            else
                chi=nthroot(1-16*czo,4);
                psi=2*log((1+chi)/2) + log((1+chi^2)/2) - 2*atan(chi) + pi/2;
                clear chi czo
            end
            %% Calculate Estimate of Friction Velocity
            cun=0.4*U(i)/(log(zm(i)./zo)-psi);
            clear psi
            %%  Test For Convergence
            dest=100*abs((cun-cuo)/cun);
            if (dest<=tol_max)
                ustar(i)=cun;
                clear cun dest
                cflg=0;
            else
                %%  Test if Final Iteration
                if (icnt==itr_max)
                    ustar(i)=cun;
                    clear cun dest
                    cflg=0;
                else
                    cuo=cun;
                    cLo=-((cuo.^3)*Tv(i))./(9.81.*0.4.*(H(i)./(rhoa(i).*Cp(i))));
                    czo=zm(i)/cLo;
                    clear cun dest
                end
            end
        end
    end
    clear cflg icnt
end
clear i L_0 ustar_0 Nprd

%%
=============================================================
====================================  %%
%%  Output Results
%%  Define Constants
```

```
hdr.a={'Year', 'Mon', 'Day', 'Hr', 'Min', 'Sec', 'tDEC', 'DOY', 'TOD', ...
       'Wind Spd', 'Tair', 'RH', 'P', 'Rn', 'G', 'H', 'LE', 'zm', ...
       'Tk', 'Tpot', 'Tv', 'q', 'r', 'eact', 'esat', 'D', 'Cp', ...
       'Lv', 'rho', 'psy', 'slp', 'ustar'};
hdr.b={'[m/s]', '[C]', '[%]', '[kPa]', '[W/m^2]', '[W/m^2]', '[W/m^2]', '[W/m^2]',
'[m]', ...
       '[K]', '[K]', '[K]', '[g/kg]', '[g/kg]', '[kPa]', '[kPa]', '[kPa]', '[J/kg K]', ...
       '[MJ/kg]', '[kg/m^3]', '[kPa/K]', '[kPa/K]', '[m/s]'};
%%  Prepare Output
out1=[dt U Tair RH P Rn G H LE zm];
out2=round(100.*[Tk Tpot Tv q r eact esat D Cp])./100;
out3=round(10000.*[Lv./1e6 rhoa psy slp ustar])./10000;


out=[out1 out2 out3];
clear dt U Tair RH P Rn G H LEo zm Tk Tpot Tv q r eact esat D Cp Lv rhoa psy slp
ustar out1 out2 out3
%%  Save Results
xlswrite([io.opath, io.oname], hdr.a,  io.osht, 'A2');
xlswrite([io.opath, io.oname], hdr.b,  io.osht, 'J3');
xlswrite([io.opath, io.oname], out  ,  io.osht, 'A4');
clear
%%
```

ALLinOne_20m.m

```
%% Create 1/17/2017
% By Zijiang Yang
% To read-in MET data from indivudual files, and generate MET input format
%% Prpare work space
clear
%% Read-in
for i = 1:10
filename = strcat('FrictionVelocity_DE_MAY_',num2str(i));
sheet = 'full';
xlrange = 'L3:T14';
if i == 1
   MET01 = xlsread(filename,sheet,xlrange);
elseif i == 2
   MET02 = xlsread(filename,sheet,xlrange);
elseif i == 3
   MET03 = xlsread(filename,sheet,xlrange);
elseif i == 4
   MET04 = xlsread(filename,sheet,xlrange);
elseif i == 5
   MET05 = xlsread(filename,sheet,xlrange);
elseif i == 6
```

```
    MET06 = xlsread(filename,sheet,xlrange);
elseif i == 7
    MET07 = xlsread(filename,sheet,xlrange);
elseif i == 8
    MET08 = xlsread(filename,sheet,xlrange);
elseif i == 9
    MET09 = xlsread(filename,sheet,xlrange);
elseif i == 10
    MET10 = xlsread(filename,sheet,xlrange);
end
end
%% Merge different parameters
%% Hour
t01 = MET01(:,1);
t02 = MET02(:,1);
t03 = MET03(:,1);
t04 = MET04(:,1);
t05 = MET05(:,1);
t06 = MET06(:,1);
t07 = MET07(:,1);
t08 = MET08(:,1);
t09 = MET09(:,1);
t10 = MET10(:,1);
% Generage hour matrix
t00 = t01;
t00(1:numel(t02),2) = t02;
t00(1:numel(t03),3) = t03;
t00(1:numel(t04),4) = t04;
t00(1:numel(t05),5) = t05;
t00(1:numel(t06),6) = t06;
t00(1:numel(t07),7) = t07;
t00(1:numel(t08),8) = t08;
t00(1:numel(t09),9) = t09;
t00(1:numel(t10),10)= t10;
t = transpose(t00);
%% Wind Speed
WS01 = MET01(:,2);WS02 = MET02(:,2);WS03 = MET03(:,2);WS04 =
MET04(:,2);WS05 = MET05(:,2);
WS06 = MET06(:,2);WS07 = MET07(:,2);WS08 = MET08(:,2);WS09 =
MET09(:,2);WS10 = MET10(:,2);
% Generate WS matrix
WS00 = WS01;WS00(1:numel(WS02),2) = WS02;WS00(1:numel(WS03),3) =
WS03;
WS00(1:numel(WS04),4) = WS04;WS00(1:numel(WS05),5) =
WS05;WS00(1:numel(WS06),6) = WS06;
```

```
WS00(1:numel(WS07),7) = WS07;WS00(1:numel(WS08),8) =
WS08;WS00(1:numel(WS09),9) = WS09;
WS00(1:numel(WS10),10)= WS10;
WS = transpose(WS00);
%% Wind Direction
WD01 = MET01(:,3);WD02 = MET02(:,3);WD03 = MET03(:,3);WD04 =
MET04(:,3);WD05 = MET05(:,3);
WD06 = MET06(:,3);WD07 = MET07(:,3);WD08 = MET08(:,3);WD09 =
MET09(:,3);WD10 = MET10(:,3);
% Generate WD matrix
WD00 = WD01;WD00(1:numel(WD02),2) = WD02;WD00(1:numel(WD03),3) =
WD03;
WD00(1:numel(WD04),4) = WD04;WD00(1:numel(WD05),5) =
WD05;WD00(1:numel(WD06),6) = WD06;
WD00(1:numel(WD07),7) = WD07;WD00(1:numel(WD08),8) =
WD08;WD00(1:numel(WD09),9) = WD09;
WD00(1:numel(WD10),10)= WD10;
WD = transpose(WD00);
%% Temperature
TA01 = MET01(:,4);TA02 = MET02(:,4);TA03 = MET03(:,4);TA04 =
MET04(:,4);TA05 = MET05(:,4);
TA06 = MET06(:,4);TA07 = MET07(:,4);TA08 = MET08(:,4);TA09 =
MET09(:,4);TA10 = MET10(:,4);
% generate Matrix
TA00 = TA01;TA00(1:numel(TA02),2) = TA02;TA00(1:numel(TA03),3) = TA03;
TA00(1:numel(TA04),4) = TA04;TA00(1:numel(TA05),5) =
TA05;TA00(1:numel(TA06),6) = TA06;
TA00(1:numel(TA07),7) = TA07;TA00(1:numel(TA08),8) =
TA08;TA00(1:numel(TA09),9) = TA09;
TA00(1:numel(TA10),10)= TA10;
TA = transpose(TA00);
%% water vapor density
RHOA01 = MET01(:,5);RHOA02 = MET02(:,5);RHOA03 = MET03(:,5);RHOA04
= MET04(:,5);RHOA05 = MET05(:,5);
RHOA06 = MET06(:,5);RHOA07 = MET07(:,5);RHOA08 = MET08(:,5);RHOA09
= MET09(:,5);RHOA10 = MET10(:,5);
RHOA00 = RHOA01;RHOA00(1:numel(RHOA02),2) =
RHOA02;RHOA00(1:numel(RHOA03),3) = RHOA03;
RHOA00(1:numel(RHOA04),4) = RHOA04;RHOA00(1:numel(RHOA05),5) =
RHOA05;RHOA00(1:numel(RHOA06),6) = RHOA06;
RHOA00(1:numel(RHOA07),7) = RHOA07;RHOA00(1:numel(RHOA08),8) =
RHOA08;RHOA00(1:numel(RHOA09),9) = RHOA09;
RHOA00(1:numel(RHOA10),10)= RHOA10;
RHOA = transpose(RHOA00);
%% Pressure
```

```
P01 = MET01(:,6);P02 = MET02(:,6);P03 = MET03(:,6);P04 = MET04(:,6);P05 =
MET05(:,6);
P06 = MET06(:,6);P07 = MET07(:,6);P08 = MET08(:,6);P09 = MET09(:,6);P10 =
MET10(:,6);
P00 = P01;P00(1:numel(P02),2) = P02;P00(1:numel(P03),3) = P03;
P00(1:numel(P04),4) = P04;P00(1:numel(P05),5) = P05;P00(1:numel(P06),6) = P06;
P00(1:numel(P07),7) = P07;P00(1:numel(P08),8) = P08;P00(1:numel(P09),9) = P09;
P00(1:numel(P10),10)= P10;
P = transpose(P00);
%% Sensible heat flux
H01 = MET01(:,7);H02 = MET02(:,7);H03 = MET03(:,7);H04 = MET04(:,7);H05 =
MET05(:,7);
H06 = MET06(:,7);H07 = MET07(:,7);H08 = MET08(:,7);H09 = MET09(:,7);H10 =
MET10(:,7);
H00 = H01;H00(1:numel(H02),2) = H02;H00(1:numel(H03),3) = H03;
H00(1:numel(H04),4) = H04;H00(1:numel(H05),5) = H05;H00(1:numel(H06),6) =
H06;
H00(1:numel(H07),7) = H07;H00(1:numel(H08),8) = H08;H00(1:numel(H09),9) =
H09;
H00(1:numel(H10),10)= H10;
H = transpose(H00);
%% Friction velosity
USTAR01 = MET01(:,8);USTAR02 = MET02(:,8);USTAR03 =
MET03(:,8);USTAR04 = MET04(:,8);USTAR05 = MET05(:,8);
USTAR06 = MET06(:,8);USTAR07 = MET07(:,8);USTAR08 =
MET08(:,8);USTAR09 = MET09(:,8);USTAR10 = MET10(:,8);
USTAR00 = USTAR01;USTAR00(1:numel(USTAR02),2) =
USTAR02;USTAR00(1:numel(USTAR03),3) = USTAR03;
USTAR00(1:numel(USTAR04),4) = USTAR04;USTAR00(1:numel(USTAR05),5) =
USTAR05;USTAR00(1:numel(USTAR06),6) = USTAR06;
USTAR00(1:numel(USTAR07),7) = USTAR07;USTAR00(1:numel(USTAR08),8) =
USTAR08;USTAR00(1:numel(USTAR09),9) = USTAR09;
USTAR00(1:numel(USTAR10),10)= USTAR10;
USTAR = transpose(USTAR00);

%% Write-out
filename = 'MET.xlsx';
sheet = 'sheet1';
%?Time step
content = t;
range = 'B1';
xlswrite(filename,content,sheet,range);
% Wind speed
content = WS;
range = 'B12';
xlswrite(filename,content,sheet,range);
```

```
% Wind Direction
content = WD;
range = 'B23';
xlswrite(filename,content,sheet,range);
% Temperature
content = TA;
range = 'B34';
xlswrite(filename,content,sheet,range);
% water vapor density
content = RHOA;
range = 'B45';
xlswrite(filename,content,sheet,range);
% Pressure
content = P;
range = 'B56';
xlswrite(filename,content,sheet,range);
% Sensible heat flux
content = H;
range = 'B67';
xlswrite(filename,content,sheet,range);
% Friction velosity
content = USTAR;
range = 'B78';
xlswrite(filename,content,sheet,range);

'MET finish'

% Qriginal Author:    JG Alfieri
% Created:   February 3, 2015
% Modified:  Zijiang Yang at:
% 2015-11-24 delete reflection & add virtual point (VP), and +L (deL), the distance
of VP and fan;
% 2016-01-28 multiple time, Loop;
% 2016-04-22 xy system;
% 2016-07-17 multiple fan & deL loop
% 2016-11-28 no grids
% 2016-12-15 Make sigma_z = sigma_y, and factor = 0.6
% 2016-12-22 Make sigma_y = sigma_z, so calculate sigma_z first, then y
%  w*,sigma_y is based on AERMOD guide
% 2016-12-25 d.h = 1/10*zi, based on Joe's email (need reference still)
% 2017-1-6 calculate ratio autimatically
% 2017-1-17 Read-in MET Input

%% Notice: VARIABLE LIST is at the end of coding

%% Prepare workspace
```

```
clear;
warning('OFF')
Con = zeros(84,138);

%% MET input read in
filename = 'MET.xlsx';
sheet = 'Sheet1';
% t = time (24 hour)
xlrange = 'B1:M10';
ln.t = xlsread(filename,sheet,xlrange);

% WS = average wind speed in 1 hour (m/s)
xlrange = 'B12:M21';
ln.WS = xlsread(filename,sheet,xlrange);

%WD = average wind direction in 1 hour (but this data is not used, since fan direction
is used)
xlrange = 'B23:M32';
ln.WD = xlsread(filename,sheet,xlrange);

%Ta = average air temperature in 1 hour (C degree)
xlrange = 'B34:M43';
ln.Ta = xlsread(filename,sheet,xlrange);

% rhove = density of water vapor (g/m^3)
xlrange = 'B1:M10';
ln.rhov = xlsread(filename,sheet,xlrange);

%P = atmosphere pressure (kPa)
xlrange = 'B45:M54';
ln.P =  xlsread(filename,sheet,xlrange);

%H = sensible heat flux (W/m^2)
xlrange = 'B67:M76';
ln.H = xlsread(filename,sheet,xlrange);

%ustar = frixlsread(filename,sheet,xlrange);ction velosity (m/s)
xlrange = 'B78:M87';
ln.ustar = xlsread(filename,sheet,xlrange);

'read-in complete'

%% Input Geometry parameters
%% factor = 1.34 for -L<z<0.1h; factor = 0.6 for 0.1h<z<0.8h
factor = 0.6
% deL = the distance between virtual point and its corresponding fan (m)
```

```
% Try = 0~11.4 ; 12~23.4 ; 24~35.4m  20+20+20 = 60 points
for deL = 0:0.6:35.4
%% Writr results into excel files
%filename = 'R_L=0~35.4.xlsx';
%sheet = num2str(deL);
%%
% releasing height (m)
R.z = 1.2;
% d.WD is constant = fan direction (Deg From N)
d.WD  =  15 ;

%% Reflection
% 0 = no, 1 = yes
Ref =    1    ;

%% Geometry
% 201505 DE 1~10
% Coordinates (x,y) of each sampling point relative to each fan (5 in total)
% z = height of each sampling point
% fan_x/ fan_y = [#1 ; #2 ; #3 ; #4 ; #5]
% #n is a matrix = [S1-1 S1-2 S1-3 S1-4 S2-1 S2-2 S2-3 S2-4 S5-1 S5-2 S5-3 S5-4
S3 S4 S6 S7]

fan_x = [-3.996 -3.996  -3.996  -3.996  -9.560  -9.560  -9.560  -9.560  -15.642 -
15.642 -15.642 -15.642 -13.634 -5.572  -23.806 -7.670;
       -2.257  -2.257  -2.257  -2.257  -7.821  -7.821  -7.821  -7.821  -13.903 -13.903 -
13.903 -13.903 -11.895 -3.833  -22.067 -5.931;
       -0.518  -0.518  -0.518  -0.518  -6.08   -6.08   -6.08   -6.08   -12.16  -12.16  -12.16
-12.16  -10.16  -2.09   -20.33  -4.19;
       1.221   1.221   1.221   1.221   -4.343  -4.343  -4.343  -4.343  -10.425 -10.425 -
10.425 -10.425 -8.417  -0.355  -18.589 -2.453;
       2.960   2.960   2.960   2.960   -2.604  -2.604  -2.604  -2.604  -8.686  -8.686  -
8.686  -8.686  -6.678  1.384   -16.850 -0.714];

fan_y = [-1.000 -1.000  -1.000  -1.000  -21.767 -21.767 -21.767 -21.767 -44.467 -
44.467 -44.467 -44.467 -20.847 -23.007 -42.661 -46.985;
       -1.466  -1.466  -1.466  -1.466  -22.233 -22.233 -22.233 -22.233 -44.933 -44.933
-44.933 -44.933 -21.313 -23.473 -43.127 -47.451;
       -1.932  -1.932  -1.932  -1.932  -22.70  -22.70  -22.70  -22.70  -45.40  -45.40  -
45.40  -45.40  -21.78  -23.94  -43.59  -47.92;
       -2.398  -2.398  -2.398  -2.398  -23.165 -23.165 -23.165 -23.165 -45.865 -45.865
-45.865 -45.865 -22.245 -24.405 -44.059 -48.383;
       -2.864  -2.864  -2.864  -2.864  -23.631 -23.631 -23.631 -23.631 -46.331 -46.331
-46.331 -46.331 -22.711 -24.871 -44.525 -48.849];

fan_z = [2  4.5 7.25    10  2   4.5 7.25    10  2   4.5 7.25    10  2   2   2   2];
```

```
%% parameters for loops
% Sf = size of fan matrix, Si = size of met(ln. ) matrix
% The following loops are for 1 caculation of 1 point (x,y,z) using 1 hour MET input
Sf = size(fan_x);
lg_x = Sf(1,2);
j_max = Sf(1,1);

Si = size(ln.t);
lg_t = Si(1,2);
k_max = Si(1,1);
n_max = Si(1,2);

%% Loops
for k=1:k_max

for j=1:j_max
%% Extract coordinates of #n fan
ln.x = fan_x(j,:);
ln.y = fan_y(j,:);
ln.z = fan_z;
m_max = length(ln.x);

%% Generate grid
%g.xmax=100;
%g.ymax=100;
%g.res =1;
%g.nx=500;
%g.ny=500;

for n=1:n_max
%% Extract 1 hourly average MET input
d.t    =  ln.t(k,n);
d.WS   =  ln.WS(k,n);
% d.WD  =  15, we have it in "input section"
d.Ta   =  ln.Ta(k,n);
d.rhov =  ln.rhov(k,n);
d.P    =  ln.P(k,n);
d.H    =  ln.H(k,n);
d.ustar=  ln.ustar(k,n);

%% (d.x1, d.y1) = coordinates of virtual point to its corresponding fan ( = fan of
interest)
d.x1 = deL*sind(d.WD);
d.y1 = deL*cosd(d.WD);
```

```
for m=1:m_max
  %% Coordinates shift (from fan to virtual point)
  % (d.x0,d.y0) = coordinates of a sampling point relative to fan of interest
  d.x0 = ln.x(m);
  d.y0 = ln.y(m);

  % (d.x1,d.y1) = coordinates of virtual point to its corresponding fan ( = fan of
interest)
  % (M.x, M.y) = coordinates of sampling point relative to virtual point
  M.x = d.x0 - d.x1;
  M.y = d.y0 - d.y1;

  % M.z = height of sampling point
  M.z=ln.z(m);

  %% Q = source strength
  Q=1;

  %% Set Figure Size
  %sz=get(0, 'ScreenSize');
  %fpos=[sz(3)-6.25*96, sz(4)-8.25*96 6*96, 7*96];
  %%  Generate Standard Grids
  %g.lin_x=linspace(-g.xmax,g.xmax,g.nx)';
  %g.lin_y=linspace(g.ymax,-g.ymax,g.ny)';
  %g.map_x=repmat(g.lin_x', g.ny,1);
  %g.map_y=repmat(g.lin_y , 1,g.nx);
  %%  Calculate  Direction of Transport
  dir_trans=270-d.WD;
  %%  Calculate Meteorological Data
  d.rhoa=(d.P.*1000)./(287.05*(d.Ta+273.15));
  d.Cp=1005.*(1+0.63.*(d.rhov./1000)./d.rhoa);
  d.L=-((d.ustar.^3).*(d.Ta+273.15))./(0.4*9.81.*d.H./(d.rhoa.*d.Cp));
  %LLL(m+(lg_x+1)*(j-1),n+(lg_t+2)*(k-1)) = d.L;
  d.zeta=M.z./d.L;
  %%  Calculate Variability in Turbulence Motion

d.sigma_y=0.6.*nthroot((9.81*10.*d.H.*abs(d.L))./((d.Ta+273.15).*d.rhoa.*d.Cp),3);
  % d.sigma_z=factor.*nthroot((9.81
*d.H.*M.z)     ./((d.Ta+273.15).*d.rhoa.*d.Cp),3);
  d.sigma_z = d.sigma_y;
  %%  Calculate Relative Positions
    rel_x= M.x*cosd(-dir_trans) - M.y *sind(-dir_trans); rel_x(rel_x<=0)=NaN;
    rel_y= M.y*cosd(-dir_trans) + M.x *sind(-dir_trans);
  %%  Calculate Standard Deviations
    std_y=rel_x.*d.sigma_y./d.WS;
    %std_z = std_y;
```

```
    %yyy(m+(lg_x+1)*(j-1),n+(lg_t+2)*(k-1)) = d.sigma_y;
    std_z=rel_x.*d.sigma_z./d.WS;
    %zzz(m+(lg_x+1)*(j-1),n+(lg_t+2)*(k-1)) = d.sigma_z;
  %%  Calculate Concentration
    term_1 =1./(2*pi.*d.WS.*std_y.*std_z);
    term_2 =exp(-(((rel_y  ).^2)./(2.*std_y.^2)));
    term_3a=exp(-(((M.z-R.z).^2)./(2.*std_z.^2)));
   %Ref: yes = 1, no = 0
    term_3b=Ref*exp(-(((M.z+R.z).^2)./(2.*std_z.^2)));
    term_3 =term_3a+term_3b;
    M.C = Q.*term_1.*term_2.*term_3;
   %%  Extract Measurement Location Concentration
    %vx=find(g.lin_x>=M.x,1,'first');
    %vy=find(g.lin_y>=M.y,1,'last');
    %M.C = C(vy,vx);

%clear rel_* std_* term_* C hb

%% to save the concentration of each run into a matrix
Con(m+(lg_x+1)*(j-1),n+(lg_t+2)*(k-1)) = M.C;


%% to demonstrate how many loops are left
%left_m = m_max - m;
%left_n = n_max - n;
%left = [k_max-k,5-j,left_n,left_m,]
end

end
end
end

%% double-check part, printed in commamd window

deL
%Clock = clock;
%[num2str(Clock(4)),':',num2str(Clock(5)),':',num2str(Clock(6))]

%% Writing content
%A = Con;
% Write !
%xlRange = 'A1';
%xlswrite(filename,A,sheet,xlRange);
```

```
%% calculate sum of n hours of different fans
% extract results of each experiment #=10
EP01 = 1;EP02 =
15;EP03=29;EP04=43;EP05=57;EP06=71;EP07=85;EP08=99;EP09=113;EP10=127;
EXP_01 =
[Con(:,EP01),Con(:,EP01+1),Con(:,EP01+2),Con(:,EP01+3),Con(:,EP01+4),Con(:,E
P01+5),Con(:,EP01+6),Con(:,EP01+7),Con(:,EP01+8),Con(:,EP01+9),Con(:,EP01+1
0),Con(:,EP01+11)];
EXP_02 =
[Con(:,EP02),Con(:,EP02+1),Con(:,EP02+2),Con(:,EP02+3),Con(:,EP02+4),Con(:,E
P02+5),Con(:,EP02+6),Con(:,EP02+7),Con(:,EP02+8),Con(:,EP02+9),Con(:,EP02+1
0),Con(:,EP02+11)];
EXP_03 =
[Con(:,EP03),Con(:,EP03+1),Con(:,EP03+2),Con(:,EP03+3),Con(:,EP03+4),Con(:,E
P03+5),Con(:,EP03+6),Con(:,EP03+7),Con(:,EP03+8),Con(:,EP03+9),Con(:,EP03+1
0),Con(:,EP03+11)];
EXP_04 =
[Con(:,EP04),Con(:,EP04+1),Con(:,EP04+2),Con(:,EP04+3),Con(:,EP04+4),Con(:,E
P04+5),Con(:,EP04+6),Con(:,EP04+7),Con(:,EP04+8),Con(:,EP04+9),Con(:,EP04+1
0),Con(:,EP04+11)];
EXP_05 =
[Con(:,EP05),Con(:,EP05+1),Con(:,EP05+2),Con(:,EP05+3),Con(:,EP05+4),Con(:,E
P05+5),Con(:,EP05+6),Con(:,EP05+7),Con(:,EP05+8),Con(:,EP05+9),Con(:,EP05+1
0),Con(:,EP05+11)];
EXP_06 =
[Con(:,EP06),Con(:,EP06+1),Con(:,EP06+2),Con(:,EP06+3),Con(:,EP06+4),Con(:,E
P06+5),Con(:,EP06+6),Con(:,EP06+7),Con(:,EP06+8),Con(:,EP06+9),Con(:,EP06+1
0),Con(:,EP06+11)];
EXP_07 =
[Con(:,EP07),Con(:,EP07+1),Con(:,EP07+2),Con(:,EP07+3),Con(:,EP07+4),Con(:,E
P07+5),Con(:,EP07+6),Con(:,EP07+7),Con(:,EP07+8),Con(:,EP07+9),Con(:,EP07+1
0),Con(:,EP07+11)];
EXP_08 =
[Con(:,EP08),Con(:,EP08+1),Con(:,EP08+2),Con(:,EP08+3),Con(:,EP08+4),Con(:,E
P08+5),Con(:,EP08+6),Con(:,EP08+7),Con(:,EP08+8),Con(:,EP08+9),Con(:,EP08+1
0),Con(:,EP08+11)];
EXP_09 =
[Con(:,EP09),Con(:,EP09+1),Con(:,EP09+2),Con(:,EP09+3),Con(:,EP09+4),Con(:,E
P09+5),Con(:,EP09+6),Con(:,EP09+7),Con(:,EP09+8),Con(:,EP09+9),Con(:,EP09+1
0),Con(:,EP09+11)];
EXP_10 =
[Con(:,EP10),Con(:,EP10+1),Con(:,EP10+2),Con(:,EP10+3),Con(:,EP10+4),Con(:,E
P10+5),Con(:,EP10+6),Con(:,EP10+7),Con(:,EP10+8),Con(:,EP10+9),Con(:,EP10+1
0),Con(:,EP10+11)];
% convert Nan into 0 in each matrix:
```

```
EXP_01(isnan(EXP_01))=0;EXP_02(isnan(EXP_02))=0;EXP_03(isnan(EXP_03))=0
;EXP_04(isnan(EXP_04))=0;EXP_05(isnan(EXP_05))=0;
EXP_06(isnan(EXP_06))=0;EXP_07(isnan(EXP_07))=0;EXP_08(isnan(EXP_08))=0
;EXP_09(isnan(EXP_09))=0;EXP_10(isnan(EXP_10))=0;
% calculate sum of matrix raws:
EXP_s01 = sum(EXP_01,2);EXP_s02 = sum(EXP_02,2);EXP_s03 =
sum(EXP_03,2);EXP_s04 = sum(EXP_04,2);EXP_s05 = sum(EXP_05,2);
EXP_s06 = sum(EXP_06,2);EXP_s07 = sum(EXP_07,2);EXP_s08 =
sum(EXP_08,2);EXP_s09 = sum(EXP_09,2);EXP_s10 = sum(EXP_10,2);

%% combine 5 fans together
for Pt = 1:16
   EXP_ss01(Pt,1) =
EXP_s01(Pt)+EXP_s01(Pt+17)+EXP_s01(Pt+17*2)+EXP_s01(Pt+17*3)+EXP_s01(
Pt+17*4);
   EXP_ss02(Pt,1) =
EXP_s02(Pt)+EXP_s02(Pt+17)+EXP_s02(Pt+17*2)+EXP_s02(Pt+17*3)+EXP_s02(
Pt+17*4);
   EXP_ss03(Pt,1) =
EXP_s03(Pt)+EXP_s03(Pt+17)+EXP_s03(Pt+17*2)+EXP_s03(Pt+17*3)+EXP_s03(
Pt+17*4);
   EXP_ss04(Pt,1) =
EXP_s04(Pt)+EXP_s04(Pt+17)+EXP_s04(Pt+17*2)+EXP_s04(Pt+17*3)+EXP_s04(
Pt+17*4);
   EXP_ss05(Pt,1) =
EXP_s05(Pt)+EXP_s05(Pt+17)+EXP_s05(Pt+17*2)+EXP_s05(Pt+17*3)+EXP_s05(
Pt+17*4);
   EXP_ss06(Pt,1) =
EXP_s06(Pt)+EXP_s06(Pt+17)+EXP_s06(Pt+17*2)+EXP_s06(Pt+17*3)+EXP_s06(
Pt+17*4);
   EXP_ss07(Pt,1) =
EXP_s07(Pt)+EXP_s07(Pt+17)+EXP_s07(Pt+17*2)+EXP_s07(Pt+17*3)+EXP_s07(
Pt+17*4);
   EXP_ss08(Pt,1) =
EXP_s08(Pt)+EXP_s08(Pt+17)+EXP_s08(Pt+17*2)+EXP_s08(Pt+17*3)+EXP_s08(
Pt+17*4);
   EXP_ss09(Pt,1) =
EXP_s09(Pt)+EXP_s09(Pt+17)+EXP_s09(Pt+17*2)+EXP_s09(Pt+17*3)+EXP_s09(
Pt+17*4);
   EXP_ss10(Pt,1) =
EXP_s10(Pt)+EXP_s10(Pt+17)+EXP_s10(Pt+17*2)+EXP_s10(Pt+17*3)+EXP_s10(
Pt+17*4);
end
%% convert concentration into ratio
EXP_r01 = EXP_ss01./EXP_ss01(1,1);
EXP_r02 = EXP_ss02./EXP_ss02(1,1);
```

```
EXP_r03 = EXP_ss03./EXP_ss03(1,1);
EXP_r04 = EXP_ss04./EXP_ss04(1,1);
EXP_r05 = EXP_ss05./EXP_ss05(1,1);
EXP_r06 = EXP_ss06./EXP_ss06(1,1);
EXP_r07 = EXP_ss07./EXP_ss07(1,1);
EXP_r08 = EXP_ss08./EXP_ss08(1,1);
EXP_r09 = EXP_ss09./EXP_ss09(1,1);
EXP_r10 = EXP_ss10./EXP_ss10(1,1);
%% Finally, get ratio matrix

%ratio = zeros(160,60);
% x = # column of del
x = round((deL+0.6)/0.6);

ratio(:,x) =
[EXP_r01;EXP_r02;EXP_r03;EXP_r04;EXP_r05;EXP_r06;EXP_r07;EXP_r08;EXP
_r09;EXP_r10];

%% write this results into Excel file

% Writing content
B = ratio;
% Write ratio!
xlRange = 'A2';
xlswrite('Summary.xlsx',B,'Pre-Reflection',xlRange);

% write L
L = 0:0.6:deL;
xlRange = 'A1';
xlswrite('Summary.xlsx',L,'Pre-Reflection',xlRange);

end
Ref

'plume finish'


%% 20m transform
% transfer from  40m into 20m
clc,clear
filename = 'Summary.xlsx';
sheet = 'Pre-Reflection';
xlrange = 'A2:BH161';
R = xlsread(filename,sheet,xlrange);

%% extract loop
```

```
for i = 1:10
R00 = [R(16*(i-1)+1,:);R(16*(i-1)+2,:);R(16*(i-1)+3,:);R(16*(i-1)+4,:);
   R(16*(i-1)+5,:);R(16*(i-1)+6,:);R(16*(i-1)+7,:);R(16*(i-1)+8,:);
   R(16*(i-1)+13,:);R(16*(i-1)+14,:)];
% EXP1
if i == 1
   R01 = R00;
% EXP2
elseif i == 2
   R02 = R00;
elseif i == 3
   R03 = R00;
elseif i == 4
   R04 = R00;
elseif i == 5
   R05 = R00;
elseif i == 6
   R06 = R00;
elseif i == 7
   R07 = R00;
elseif i == 8
   R08 = R00;
elseif i == 9
   R09 = R00;
elseif i == 10
   R10 = R00;
end
end
% Generate new R of 20m format
New_R = [R01;R02;R03;R04;R05;R06;R07;R08;R09;R10];
%% Write-out
content = New_R;
sheet = 'Reflection'
range = 'A2';
xlswrite(filename,content,sheet,range);

'20m transform finish'


%% Zijiang Yang 12-08-2016
% This is used to transfer ratio into FMP;
% This is for 20m-ranged calculation

%% Prepare work space
clear
```

```
%% Obs read-in
% (1). NH3 part:
filename = 'Obs cocentration.xlsx';
sheet = 'NH3_20m';
%xlRange = ;
NH3_Obs = xlsread(filename,sheet,'C2:C161');
NH3_Bg = xlsread(filename,sheet,'F2:F161');
NH3_Cali = xlsread(filename,sheet,'G2:G161');
NH3_2 =  xlsread(filename,sheet,'D2:D161');
NH3_05 = xlsread(filename,sheet,'E2:E161');
% (2). PM part:
filename = 'Obs cocentration.xlsx';
sheet = 'PM_20m';
%xlRange = ;
PM_Obs = xlsread(filename,sheet,'C2:C161');
PM_Bg = xlsread(filename,sheet,'F2:F161');
PM_Cali = xlsread(filename,sheet,'G2:G161');
PM_2 =  xlsread(filename,sheet,'D2:D161');
PM_05 = xlsread(filename,sheet,'E2:E161');
%%
% Read ratio into Matlab
filename = 'Summary.xlsx';
sheet = 'Reflection';
%xlRange = ;
Ratio = xlsread(filename,sheet,'A2:BH161');
% Loop numbers: Loop = # of columns of Ratio
Size = size(Ratio);
Loop_colomn = Size(1,2);
Loop_row = Size(1,1);
% This loop is to use ratio, to calculate FMp
for n = 1:1:Loop_colomn
    % R is the ratio of 20m-ranged points of 10 EXP of a given deL
    R = Ratio(:,n);
    % Accoding to Mp = R*Cali, we have:
    NH3_Mp = R.* NH3_Cali ;
    PM_Mp  = R.* PM_Cali ;
    % According to FMp = Mp + Bg, we have:
    NH3_FMp = NH3_Mp + NH3_Bg ;
    PM_FMp = PM_Mp + PM_Bg ;
    %% Save FMp into matrix and into Excel file
    NH3_FFMp(:,n) = NH3_FMp;
    PM_FFMp(:,n) = PM_FMp;
    filename = 'FMp_20m.xlsx';
    % For NH3
    sheet = 'R_NH3_20m';
    xlswrite(filename,NH3_FFMp,sheet,'C2');
```

```
    % For PM
    sheet = 'R_PM_20m';
    xlswrite(filename,PM_FFMp,sheet,'C2');
    %% Calculation of Insider ratio
    % NH3 TF = true or false, if insider = 1, outside = 0
    for m = 1:1:Loop_row
       % NH3_FMp_1 = a single number of NH3 value
       NH3_FMp_1 = NH3_FMp(m);
       NH3_2_1 = NH3_2(m);
       NH3_05_1 = NH3_05(m);
      if NH3_FMp_1 > NH3_2_1
         NH3_TF_1 = 0;
      elseif NH3_FMp_1 < NH3_05_1
            NH3_TF_1 = 0;
      else
         NH3_TF_1 = 1;
      end
      NH3_TF(m,n) =  NH3_TF_1;
    end
    % PM TF = true or false, if insider = 1, outside = 0
    for k = 1:1:Loop_row
       % NH3_FMp_1 = a single number of NH3 value
       PM_FMp_1 = PM_FMp(k);
       PM_2_1 = PM_2(k);
       PM_05_1 = PM_05(k);
      if PM_FMp_1 > PM_2_1
         PM_TF_1 = 0;
      elseif PM_FMp_1 < PM_05_1
            PM_TF_1 = 0;
      else
         PM_TF_1 = 1;
      end
      PM_TF(k,n) =  PM_TF_1;
    end
end
% get the sum of TF matrix, and calculate IS
    NH3_IS_pre = sum(NH3_TF);
    NH3_IS = NH3_IS_pre./Loop_row;
    PM_IS_pre = sum(PM_TF);
    PM_IS = PM_IS_pre./Loop_row;
    %% Print the results and deL
    deL = 0:0.6:35.4;
    filename = '20m_deL_vs_IS.xlsx';
    sheet = '20m';
    % Wrting title
    A = {'Ratio_R_NH3_20','Ratio_R_PM_20'};
```

```
    % Writing content
    B = [NH3_IS', PM_IS'];
    xlswrite(filename,A,sheet,'D1');
    xlswrite(filename,B,sheet,'D2');
    xlswrite(filename,deL',sheet,'A2');
    xlswrite(filename,'L',sheet,'A1');

    'ALL finish'
```

ALLinOne_40m.m

```
%% MET input
% Create 1/17/2017
% By Zijiang Yang
% To read-in MET data from indivudual files, and generate MET input format
%% Prpare work space
clc;clear
%% Read-in
for i = 1:10
filename = strcat('FrictionVelocity_DE_MAY_',num2str(i));
sheet = 'full';
xlrange = 'L3:T14';
if i == 1
    MET01 = xlsread(filename,sheet,xlrange);
elseif i == 2
    MET02 = xlsread(filename,sheet,xlrange);
elseif i == 3
    MET03 = xlsread(filename,sheet,xlrange);
elseif i == 4
    MET04 = xlsread(filename,sheet,xlrange);
elseif i == 5
    MET05 = xlsread(filename,sheet,xlrange);
elseif i == 6
    MET06 = xlsread(filename,sheet,xlrange);
elseif i == 7
    MET07 = xlsread(filename,sheet,xlrange);
elseif i == 8
    MET08 = xlsread(filename,sheet,xlrange);
elseif i == 9
    MET09 = xlsread(filename,sheet,xlrange);
elseif i == 10
    MET10 = xlsread(filename,sheet,xlrange);
end
end
%% Merge different parameters
%% Hour
```

```
t01 = MET01(:,1);
t02 = MET02(:,1);
t03 = MET03(:,1);
t04 = MET04(:,1);
t05 = MET05(:,1);
t06 = MET06(:,1);
t07 = MET07(:,1);
t08 = MET08(:,1);
t09 = MET09(:,1);
t10 = MET10(:,1);
% Generage hour matrix
t00 = t01;
t00(1:numel(t02),2) = t02;
t00(1:numel(t03),3) = t03;
t00(1:numel(t04),4) = t04;
t00(1:numel(t05),5) = t05;
t00(1:numel(t06),6) = t06;
t00(1:numel(t07),7) = t07;
t00(1:numel(t08),8) = t08;
t00(1:numel(t09),9) = t09;
t00(1:numel(t10),10)= t10;
t = transpose(t00);
%% Wind Speed
WS01 = MET01(:,2);WS02 = MET02(:,2);WS03 = MET03(:,2);WS04 =
MET04(:,2);WS05 = MET05(:,2);
WS06 = MET06(:,2);WS07 = MET07(:,2);WS08 = MET08(:,2);WS09 =
MET09(:,2);WS10 = MET10(:,2);
% Generate WS matrix
WS00 = WS01;WS00(1:numel(WS02),2) = WS02;WS00(1:numel(WS03),3) =
WS03;
WS00(1:numel(WS04),4) = WS04;WS00(1:numel(WS05),5) =
WS05;WS00(1:numel(WS06),6) = WS06;
WS00(1:numel(WS07),7) = WS07;WS00(1:numel(WS08),8) =
WS08;WS00(1:numel(WS09),9) = WS09;
WS00(1:numel(WS10),10)= WS10;
WS = transpose(WS00);
%% Wind Direction
WD01 = MET01(:,3);WD02 = MET02(:,3);WD03 = MET03(:,3);WD04 =
MET04(:,3);WD05 = MET05(:,3);
WD06 = MET06(:,3);WD07 = MET07(:,3);WD08 = MET08(:,3);WD09 =
MET09(:,3);WD10 = MET10(:,3);
% Generate WD matrix
WD00 = WD01;WD00(1:numel(WD02),2) = WD02;WD00(1:numel(WD03),3) =
WD03;
WD00(1:numel(WD04),4) = WD04;WD00(1:numel(WD05),5) =
WD05;WD00(1:numel(WD06),6) = WD06;
```

```
WD00(1:numel(WD07),7) = WD07;WD00(1:numel(WD08),8) =
WD08;WD00(1:numel(WD09),9) = WD09;
WD00(1:numel(WD10),10)= WD10;
WD = transpose(WD00);
%% Temperature
TA01 = MET01(:,4);TA02 = MET02(:,4);TA03 = MET03(:,4);TA04 =
MET04(:,4);TA05 = MET05(:,4);
TA06 = MET06(:,4);TA07 = MET07(:,4);TA08 = MET08(:,4);TA09 =
MET09(:,4);TA10 = MET10(:,4);
% generate Matrix
TA00 = TA01;TA00(1:numel(TA02),2) = TA02;TA00(1:numel(TA03),3) = TA03;
TA00(1:numel(TA04),4) = TA04;TA00(1:numel(TA05),5) =
TA05;TA00(1:numel(TA06),6) = TA06;
TA00(1:numel(TA07),7) = TA07;TA00(1:numel(TA08),8) =
TA08;TA00(1:numel(TA09),9) = TA09;
TA00(1:numel(TA10),10)= TA10;
TA = transpose(TA00);
%% water vapor density
RHOA01 = MET01(:,5);RHOA02 = MET02(:,5);RHOA03 = MET03(:,5);RHOA04
= MET04(:,5);RHOA05 = MET05(:,5);
RHOA06 = MET06(:,5);RHOA07 = MET07(:,5);RHOA08 = MET08(:,5);RHOA09
= MET09(:,5);RHOA10 = MET10(:,5);
RHOA00 = RHOA01;RHOA00(1:numel(RHOA02),2) =
RHOA02;RHOA00(1:numel(RHOA03),3) = RHOA03;
RHOA00(1:numel(RHOA04),4) = RHOA04;RHOA00(1:numel(RHOA05),5) =
RHOA05;RHOA00(1:numel(RHOA06),6) = RHOA06;
RHOA00(1:numel(RHOA07),7) = RHOA07;RHOA00(1:numel(RHOA08),8) =
RHOA08;RHOA00(1:numel(RHOA09),9) = RHOA09;
RHOA00(1:numel(RHOA10),10)= RHOA10;
RHOA = transpose(RHOA00);
%% Pressure
P01 = MET01(:,6);P02 = MET02(:,6);P03 = MET03(:,6);P04 = MET04(:,6);P05 =
MET05(:,6);
P06 = MET06(:,6);P07 = MET07(:,6);P08 = MET08(:,6);P09 = MET09(:,6);P10 =
MET10(:,6);
P00 = P01;P00(1:numel(P02),2) = P02;P00(1:numel(P03),3) = P03;
P00(1:numel(P04),4) = P04;P00(1:numel(P05),5) = P05;P00(1:numel(P06),6) = P06;
P00(1:numel(P07),7) = P07;P00(1:numel(P08),8) = P08;P00(1:numel(P09),9) = P09;
P00(1:numel(P10),10)= P10;
P = transpose(P00);
%% Sensible heat flux
H01 = MET01(:,7);H02 = MET02(:,7);H03 = MET03(:,7);H04 = MET04(:,7);H05 =
MET05(:,7);
H06 = MET06(:,7);H07 = MET07(:,7);H08 = MET08(:,7);H09 = MET09(:,7);H10 =
MET10(:,7);
H00 = H01;H00(1:numel(H02),2) = H02;H00(1:numel(H03),3) = H03;
```

```
H00(1:numel(H04),4) = H04;H00(1:numel(H05),5) = H05;H00(1:numel(H06),6) =
H06;
H00(1:numel(H07),7) = H07;H00(1:numel(H08),8) = H08;H00(1:numel(H09),9) =
H09;
H00(1:numel(H10),10)= H10;
H = transpose(H00);
%% Friction velosity
USTAR01 = MET01(:,8);USTAR02 = MET02(:,8);USTAR03 =
MET03(:,8);USTAR04 = MET04(:,8);USTAR05 = MET05(:,8);
USTAR06 = MET06(:,8);USTAR07 = MET07(:,8);USTAR08 =
MET08(:,8);USTAR09 = MET09(:,8);USTAR10 = MET10(:,8);
USTAR00 = USTAR01;USTAR00(1:numel(USTAR02),2) =
USTAR02;USTAR00(1:numel(USTAR03),3) = USTAR03;
USTAR00(1:numel(USTAR04),4) = USTAR04;USTAR00(1:numel(USTAR05),5) =
USTAR05;USTAR00(1:numel(USTAR06),6) = USTAR06;
USTAR00(1:numel(USTAR07),7) = USTAR07;USTAR00(1:numel(USTAR08),8) =
USTAR08;USTAR00(1:numel(USTAR09),9) = USTAR09;
USTAR00(1:numel(USTAR10),10)= USTAR10;
USTAR = transpose(USTAR00);

%% Write-out
filename = 'MET.xlsx';
sheet = 'sheet1';
%?Time step
content = t;
range = 'B1';
xlswrite(filename,content,sheet,range);
% Wind speed
content = WS;
range = 'B12';
xlswrite(filename,content,sheet,range);
% Wind Direction
content = WD;
range = 'B23';
xlswrite(filename,content,sheet,range);
% Temperature
content = TA;
range = 'B34';
xlswrite(filename,content,sheet,range);
% water vapor density
content = RHOA;
range = 'B45';
xlswrite(filename,content,sheet,range);
% Pressure
content = P;
range = 'B56';
```

```
xlswrite(filename,content,sheet,range);
% Sensible heat flux
content = H;
range = 'B67';
xlswrite(filename,content,sheet,range);
% Friction velocity
content = USTAR;
range = 'B78';
xlswrite(filename,content,sheet,range);

'finish MET calculation'

%% Plume concentration
% Qriginal Author:    JG Alfieri
% Created:   February 3, 2015
% Modified:  Zijiang Yang at:
% 2015-11-24 delete reflection & add virtual point (VP), and +L (deL), the distance
of VP and fan;
% 2016-01-28 multiple time, Loop;
% 2016-04-22 xy system;
% 2016-07-17 multiple fan & deL loop
% 2016-11-28 no grids
% 2016-12-15 Make sigma_z = sigma_y, and factor = 0.6
% 2016-12-22 Make sigma_y = sigma_z, so calculate sigma_z first, then y
%  w*,sigma_y is based on AERMOD guide
% 2016-12-25 d.h = 1/10*zi, based on Joe's email (need reference still)
% 2017-1-6 calculate ratio autimatically
% 2017-1-17 Read-in MET Input

%% Notice: VARIABLE LIST is at the end of coding

%% Prepare workspace
clear

warning('OFF')
Con = zeros(84,138);

%% MET input read in
filename = 'MET.xlsx';
sheet = 'Sheet1';
% t = time (24 hour)
xlrange = 'B1:M10';
ln.t = xlsread(filename,sheet,xlrange);

% WS = average wind speed in 1 hour (m/s)
xlrange = 'B12:M21';
```

```
ln.WS = xlsread(filename,sheet,xlrange);

%WD = average wind direction in 1 hour (but this data is not used, since fan direction
is used)
xlrange = 'B23:M32';
ln.WD = xlsread(filename,sheet,xlrange);

%Ta = average air temperature in 1 hour (C degree)
xlrange = 'B34:M43';
ln.Ta = xlsread(filename,sheet,xlrange);

% rhove = density of water vapor (g/m^3)
xlrange = 'B1:M10';
ln.rhov = xlsread(filename,sheet,xlrange);

%P = atmosphere pressure (kPa)
xlrange = 'B45:M54';
ln.P =  xlsread(filename,sheet,xlrange);

%H = sensible heat flux (W/m^2)
xlrange = 'B67:M76';
ln.H = xlsread(filename,sheet,xlrange);

%ustar = frixlsread(filename,sheet,xlrange);ction velosity (m/s)
xlrange = 'B78:M87';
ln.ustar = xlsread(filename,sheet,xlrange);

'read-in complete'

%% Input Geometry parameters
%% factor = 1.34 for -L<z<0.1h; factor = 0.6 for 0.1h<z<0.8h
factor = 0.6
% deL = the distance between virtual point and its corresponding fan (m)
% Try = 0~11.4 ; 12~23.4 ; 24~35.4m  20+20+20 = 60 points
for deL = 0:0.6:35.4
%% Writr results into excel files
filename = 'R_L=0~35.4.xlsx';
sheet = num2str(deL);
%%
% releasing height (m)
R.z = 1.2;
% d.WD is constant = fan direction (Deg From N)
d.WD  =  15 ;

%% Reflection
% 0 = no, 1 = yes
```

```
Ref =    1    ;

%% Geometry
% 201505 DE 1~10
% Coordinates (x,y) of each sampling point relative to each fan (5 in total)
% z = height of each sampling point
% fan_x/ fan_y = [#1 ; #2 ; #3 ; #4 ; #5]
% #n is a matrix = [S1-1 S1-2 S1-3 S1-4 S2-1 S2-2 S2-3 S2-4 S5-1 S5-2 S5-3 S5-4
S3 S4 S6 S7]

fan_x = [-3.996 -3.996  -3.996  -3.996  -9.560  -9.560  -9.560  -9.560  -15.642 -
15.642 -15.642 -15.642 -13.634 -5.572  -23.806 -7.670;
       -2.257  -2.257  -2.257  -2.257  -7.821  -7.821  -7.821  -7.821  -13.903 -13.903 -
13.903 -13.903 -11.895 -3.833  -22.067 -5.931;
       -0.518  -0.518  -0.518  -0.518  -6.08   -6.08   -6.08   -6.08   -12.16  -12.16  -12.16
-12.16  -10.16  -2.09   -20.33  -4.19;
       1.221   1.221   1.221   1.221   -4.343  -4.343  -4.343  -4.343  -10.425 -10.425 -
10.425 -10.425 -8.417  -0.355  -18.589 -2.453;
       2.960   2.960   2.960   2.960   -2.604  -2.604  -2.604  -2.604  -8.686  -8.686  -
8.686  -8.686  -6.678  1.384   -16.850 -0.714];

fan_y = [-1.000 -1.000  -1.000  -1.000  -21.767 -21.767 -21.767 -21.767 -44.467 -
44.467 -44.467 -44.467 -20.847 -23.007 -42.661 -46.985;
       -1.466  -1.466  -1.466  -1.466  -22.233 -22.233 -22.233 -22.233 -44.933 -44.933
-44.933 -44.933 -21.313 -23.473 -43.127 -47.451;
       -1.932  -1.932  -1.932  -1.932  -22.70  -22.70  -22.70  -22.70  -45.40  -45.40  -
45.40  -45.40  -21.78  -23.94  -43.59  -47.92;
       -2.398  -2.398  -2.398  -2.398  -23.165 -23.165 -23.165 -23.165 -45.865 -45.865
-45.865 -45.865 -22.245 -24.405 -44.059 -48.383;
       -2.864  -2.864  -2.864  -2.864  -23.631 -23.631 -23.631 -23.631 -46.331 -46.331
-46.331 -46.331 -22.711 -24.871 -44.525 -48.849];

fan_z = [2  4.5 7.25    10  2   4.5 7.25    10  2   4.5 7.25    10  2   2   2   2];

%% parameters for loops
% Sf = size of fan matrix, Si = size of met(ln. ) matrix
% The following loops are for 1 caculation of 1 point (x,y,z) using 1 hour MET input
Sf = size(fan_x);
lg_x = Sf(1,2);
j_max = Sf(1,1);

Si = size(ln.t);
lg_t = Si(1,2);
k_max = Si(1,1);
n_max = Si(1,2);
```

```
%% Loops
for k=1:k_max

for j=1:j_max
%% Extract coordinates of #n fan
ln.x = fan_x(j,:);
ln.y = fan_y(j,:);
ln.z = fan_z;
m_max = length(ln.x);

%% Generate grid
%g.xmax=100;
%g.ymax=100;
%g.res =1;
%g.nx=500;
%g.ny=500;

for n=1:n_max
%% Extract 1 hourly average MET input
d.t    =  ln.t(k,n);
d.WS   =  ln.WS(k,n);
% d.WD  =  15, we have it in "input section"
d.Ta   =  ln.Ta(k,n);
d.rhov =  ln.rhov(k,n);
d.P    =  ln.P(k,n);
d.H    =  ln.H(k,n);
d.ustar=  ln.ustar(k,n);

%% (d.x1, d.y1) = coordinates of virtual point to its corresponding fan ( = fan of
interest)
d.x1 = deL*sind(d.WD);
d.y1 = deL*cosd(d.WD);

for m=1:m_max
  %% Coordinates shift (from fan to virtual point)
  % (d.x0,d.y0) = coordinates of a sampling point relative to fan of interest
  d.x0 = ln.x(m);
  d.y0 = ln.y(m);

  % (d.x1,d.y1) = coordinates of virtual point to its corresponding fan ( = fan of
interest)
  % (M.x, M.y) = coordinates of sampling point relative to virtual point
  M.x = d.x0 - d.x1;
  M.y = d.y0 - d.y1;

  % M.z = height of sampling point
```

```
M.z=ln.z(m);

%% Q = source strength
Q=1;

%% Set Figure Size
%sz=get(0, 'ScreenSize');
%fpos=[sz(3)-6.25*96, sz(4)-8.25*96 6*96, 7*96];
%%  Generate Standard Grids
%g.lin_x=linspace(-g.xmax,g.xmax,g.nx)';
%g.lin_y=linspace(g.ymax,-g.ymax,g.ny)';
%g.map_x=repmat(g.lin_x', g.ny,1);
%g.map_y=repmat(g.lin_y , 1,g.nx);
%%  Calculate  Direction of Transport
dir_trans=270-d.WD;
%%  Calculate Meteorological Data
d.rhoa=(d.P.*1000)./(287.05*(d.Ta+273.15));
d.Cp=1005.*(1+0.63.*(d.rhov./1000)./d.rhoa);
d.L=-((d.ustar.^3).*(d.Ta+273.15))./(0.4*9.81.*d.H./(d.rhoa.*d.Cp));
%LLL(m+(lg_x+1)*(j-1),n+(lg_t+2)*(k-1)) = d.L;
d.zeta=M.z./d.L;
%%  Calculate Variability in Turbulence Motion

d.sigma_y=0.6.*nthroot((9.81*10.*d.H.*abs(d.L))./((d.Ta+273.15).*d.rhoa.*d.Cp),3);
% d.sigma_z=factor.*nthroot((9.81
*d.H.*M.z)     ./((d.Ta+273.15).*d.rhoa.*d.Cp),3);
d.sigma_z = d.sigma_y;
%%  Calculate Relative Positions
  rel_x= M.x*cosd(-dir_trans) - M.y *sind(-dir_trans); rel_x(rel_x<=0)=NaN;
  rel_y= M.y*cosd(-dir_trans) + M.x *sind(-dir_trans);
%%  Calculate Standard Deviations
  std_y=rel_x.*d.sigma_y./d.WS;
  %std_z = std_y;
  %yyy(m+(lg_x+1)*(j-1),n+(lg_t+2)*(k-1)) = d.sigma_y;
  std_z=rel_x.*d.sigma_z./d.WS;
  %zzz(m+(lg_x+1)*(j-1),n+(lg_t+2)*(k-1)) = d.sigma_z;
%%  Calculate Concentration
  term_1 =1./(2*pi.*d.WS.*std_y.*std_z);
  term_2 =exp(-(((rel_y  ).^2)./(2.*std_y.^2)));
  term_3a=exp(-(((M.z-R.z).^2)./(2.*std_z.^2)));
 %Ref: yes = 1, no = 0
  term_3b=Ref*exp(-(((M.z+R.z).^2)./(2.*std_z.^2)));
  term_3 =term_3a+term_3b;
  M.C = Q.*term_1.*term_2.*term_3;
 %%  Extract Measurement Location Concentration
  %vx=find(g.lin_x>=M.x,1,'first');
```

```
    %vy=find(g.lin_y>=M.y,1,'last');
    %M.C = C(vy,vx);

%clear rel_* std_* term_* C hb

%% to save the concentration of each run into a matrix
Con(m+(lg_x+1)*(j-1),n+(lg_t+2)*(k-1)) = M.C;


%% to demonstrate how many loops are left
%left_m = m_max - m;
%left_n = n_max - n;
%left = [k_max-k,5-j,left_n,left_m,]
end

end
end
end

%% double-check part, printed in commamd window

deL
%Clock = clock;
%[num2str(Clock(4)),':',num2str(Clock(5)),':',num2str(Clock(6))]

%% Writing content
%A = Con;
% Write !
%xlRange = 'A1';
%xlswrite(filename,A,sheet,xlRange);



%% calculate sum of n hours of different fans
% extract results of each experiment #=10
EP01 = 1;EP02 =
15;EP03=29;EP04=43;EP05=57;EP06=71;EP07=85;EP08=99;EP09=113;EP10=127;
EXP_01 =
[Con(:,EP01),Con(:,EP01+1),Con(:,EP01+2),Con(:,EP01+3),Con(:,EP01+4),Con(:,E
P01+5),Con(:,EP01+6),Con(:,EP01+7),Con(:,EP01+8),Con(:,EP01+9),Con(:,EP01+1
0),Con(:,EP01+11)];
EXP_02 =
[Con(:,EP02),Con(:,EP02+1),Con(:,EP02+2),Con(:,EP02+3),Con(:,EP02+4),Con(:,E
P02+5),Con(:,EP02+6),Con(:,EP02+7),Con(:,EP02+8),Con(:,EP02+9),Con(:,EP02+1
0),Con(:,EP02+11)];
```

```
EXP_03 =
[Con(:,EP03),Con(:,EP03+1),Con(:,EP03+2),Con(:,EP03+3),Con(:,EP03+4),Con(:,E
P03+5),Con(:,EP03+6),Con(:,EP03+7),Con(:,EP03+8),Con(:,EP03+9),Con(:,EP03+1
0),Con(:,EP03+11)];
EXP_04 =
[Con(:,EP04),Con(:,EP04+1),Con(:,EP04+2),Con(:,EP04+3),Con(:,EP04+4),Con(:,E
P04+5),Con(:,EP04+6),Con(:,EP04+7),Con(:,EP04+8),Con(:,EP04+9),Con(:,EP04+1
0),Con(:,EP04+11)];
EXP_05 =
[Con(:,EP05),Con(:,EP05+1),Con(:,EP05+2),Con(:,EP05+3),Con(:,EP05+4),Con(:,E
P05+5),Con(:,EP05+6),Con(:,EP05+7),Con(:,EP05+8),Con(:,EP05+9),Con(:,EP05+1
0),Con(:,EP05+11)];
EXP_06 =
[Con(:,EP06),Con(:,EP06+1),Con(:,EP06+2),Con(:,EP06+3),Con(:,EP06+4),Con(:,E
P06+5),Con(:,EP06+6),Con(:,EP06+7),Con(:,EP06+8),Con(:,EP06+9),Con(:,EP06+1
0),Con(:,EP06+11)];
EXP_07 =
[Con(:,EP07),Con(:,EP07+1),Con(:,EP07+2),Con(:,EP07+3),Con(:,EP07+4),Con(:,E
P07+5),Con(:,EP07+6),Con(:,EP07+7),Con(:,EP07+8),Con(:,EP07+9),Con(:,EP07+1
0),Con(:,EP07+11)];
EXP_08 =
[Con(:,EP08),Con(:,EP08+1),Con(:,EP08+2),Con(:,EP08+3),Con(:,EP08+4),Con(:,E
P08+5),Con(:,EP08+6),Con(:,EP08+7),Con(:,EP08+8),Con(:,EP08+9),Con(:,EP08+1
0),Con(:,EP08+11)];
EXP_09 =
[Con(:,EP09),Con(:,EP09+1),Con(:,EP09+2),Con(:,EP09+3),Con(:,EP09+4),Con(:,E
P09+5),Con(:,EP09+6),Con(:,EP09+7),Con(:,EP09+8),Con(:,EP09+9),Con(:,EP09+1
0),Con(:,EP09+11)];
EXP_10 =
[Con(:,EP10),Con(:,EP10+1),Con(:,EP10+2),Con(:,EP10+3),Con(:,EP10+4),Con(:,E
P10+5),Con(:,EP10+6),Con(:,EP10+7),Con(:,EP10+8),Con(:,EP10+9),Con(:,EP10+1
0),Con(:,EP10+11)];
% convert Nan into 0 in each matrix:
EXP_01(isnan(EXP_01))=0;EXP_02(isnan(EXP_02))=0;EXP_03(isnan(EXP_03))=0
;EXP_04(isnan(EXP_04))=0;EXP_05(isnan(EXP_05))=0;
EXP_06(isnan(EXP_06))=0;EXP_07(isnan(EXP_07))=0;EXP_08(isnan(EXP_08))=0
;EXP_09(isnan(EXP_09))=0;EXP_10(isnan(EXP_10))=0;
% calculate sum of matrix raws:
EXP_s01 = sum(EXP_01,2);EXP_s02 = sum(EXP_02,2);EXP_s03 =
sum(EXP_03,2);EXP_s04 = sum(EXP_04,2);EXP_s05 = sum(EXP_05,2);
EXP_s06 = sum(EXP_06,2);EXP_s07 = sum(EXP_07,2);EXP_s08 =
sum(EXP_08,2);EXP_s09 = sum(EXP_09,2);EXP_s10 = sum(EXP_10,2);

%% combine 5 fans together
for Pt = 1:16
```

```
   EXP_ss01(Pt,1) =
EXP_s01(Pt)+EXP_s01(Pt+17)+EXP_s01(Pt+17*2)+EXP_s01(Pt+17*3)+EXP_s01(
Pt+17*4);
   EXP_ss02(Pt,1) =
EXP_s02(Pt)+EXP_s02(Pt+17)+EXP_s02(Pt+17*2)+EXP_s02(Pt+17*3)+EXP_s02(
Pt+17*4);
   EXP_ss03(Pt,1) =
EXP_s03(Pt)+EXP_s03(Pt+17)+EXP_s03(Pt+17*2)+EXP_s03(Pt+17*3)+EXP_s03(
Pt+17*4);
   EXP_ss04(Pt,1) =
EXP_s04(Pt)+EXP_s04(Pt+17)+EXP_s04(Pt+17*2)+EXP_s04(Pt+17*3)+EXP_s04(
Pt+17*4);
   EXP_ss05(Pt,1) =
EXP_s05(Pt)+EXP_s05(Pt+17)+EXP_s05(Pt+17*2)+EXP_s05(Pt+17*3)+EXP_s05(
Pt+17*4);
   EXP_ss06(Pt,1) =
EXP_s06(Pt)+EXP_s06(Pt+17)+EXP_s06(Pt+17*2)+EXP_s06(Pt+17*3)+EXP_s06(
Pt+17*4);
   EXP_ss07(Pt,1) =
EXP_s07(Pt)+EXP_s07(Pt+17)+EXP_s07(Pt+17*2)+EXP_s07(Pt+17*3)+EXP_s07(
Pt+17*4);
   EXP_ss08(Pt,1) =
EXP_s08(Pt)+EXP_s08(Pt+17)+EXP_s08(Pt+17*2)+EXP_s08(Pt+17*3)+EXP_s08(
Pt+17*4);
   EXP_ss09(Pt,1) =
EXP_s09(Pt)+EXP_s09(Pt+17)+EXP_s09(Pt+17*2)+EXP_s09(Pt+17*3)+EXP_s09(
Pt+17*4);
   EXP_ss10(Pt,1) =
EXP_s10(Pt)+EXP_s10(Pt+17)+EXP_s10(Pt+17*2)+EXP_s10(Pt+17*3)+EXP_s10(
Pt+17*4);
end
%% convert concentration into ratio
EXP_r01 = EXP_ss01./EXP_ss01(1,1);
EXP_r02 = EXP_ss02./EXP_ss02(1,1);
EXP_r03 = EXP_ss03./EXP_ss03(1,1);
EXP_r04 = EXP_ss04./EXP_ss04(1,1);
EXP_r05 = EXP_ss05./EXP_ss05(1,1);
EXP_r06 = EXP_ss06./EXP_ss06(1,1);
EXP_r07 = EXP_ss07./EXP_ss07(1,1);
EXP_r08 = EXP_ss08./EXP_ss08(1,1);
EXP_r09 = EXP_ss09./EXP_ss09(1,1);
EXP_r10 = EXP_ss10./EXP_ss10(1,1);
%% Finally, get ratio matrix

%ratio = zeros(160,60);
% x = # column of del
```

```matlab
x = round((deL+0.6)/0.6);

ratio(:,x) =
[EXP_r01;EXP_r02;EXP_r03;EXP_r04;EXP_r05;EXP_r06;EXP_r07;EXP_r08;EXP
_r09;EXP_r10];

%% write this results into Excel file

% Writing content
B = ratio;
% Write ratio!
xlRange = 'A2';
xlswrite('Summary.xlsx',B,'Reflection',xlRange);

% write L
L = 0:0.6:deL;
xlRange = 'A1';
xlswrite('Summary.xlsx',L,'Reflection',xlRange);

end
'plume finish'

%% Ratio calculate
% Zijiang Yang 12-08-2016
% This is used to transfer ratio into FMP;
% This is for 20m-ranged calculation

%% Prepare work space
clear

%% Obs read-in
% (1). NH3 part:
filename = 'Obs cocentration.xlsx';
sheet = 'NH3_40m';
%xlRange = ;
NH3_Obs = xlsread(filename,sheet,'C2:C161');
NH3_Bg = xlsread(filename,sheet,'F2:F161');
NH3_Cali = xlsread(filename,sheet,'G2:G161');
NH3_2 =  xlsread(filename,sheet,'D2:D161');
NH3_05 = xlsread(filename,sheet,'E2:E161');
% (2). PM part:
filename = 'Obs cocentration.xlsx';
sheet = 'PM_40m';
%xlRange = ;
PM_Obs = xlsread(filename,sheet,'C2:C161');
PM_Bg = xlsread(filename,sheet,'F2:F161');
```

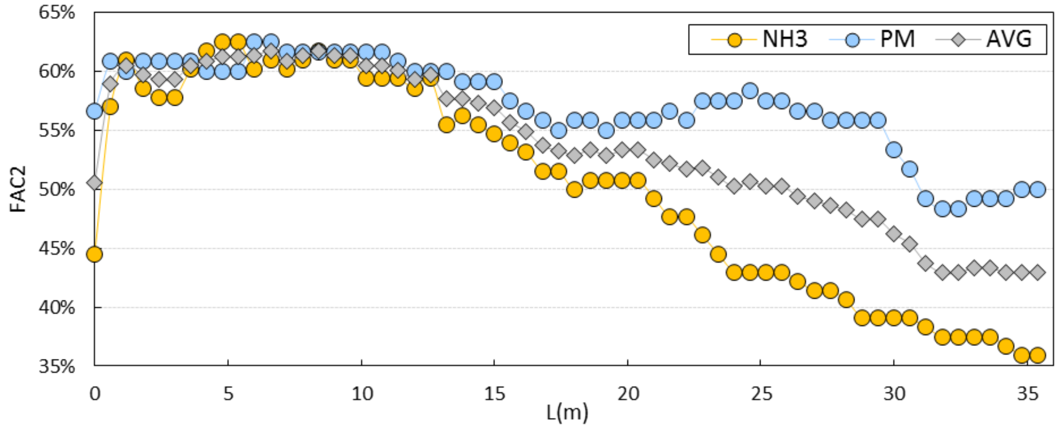
```
PM_Cali = xlsread(filename,sheet,'G2:G161');
PM_2 =  xlsread(filename,sheet,'D2:D161');
PM_05 = xlsread(filename,sheet,'E2:E161');
%%
% Read ratio into Matlab
filename = 'Summary.xlsx';
sheet = 'Reflection';
%xlRange = ;
Ratio = xlsread(filename,sheet,'A2:BH161');
% Loop numbers: Loop = # of columns of Ratio
Size = size(Ratio);
Loop_colomn = Size(1,2);
Loop_row = Size(1,1);
% This loop is to use ratio, to calculate FMp
for n = 1:1:Loop_colomn
   % R is the ratio of 20m-ranged points of 10 EXP of a given deL
   R = Ratio(:,n);
   % Accoding to Mp = R*Cali, we have:
   NH3_Mp = R.* NH3_Cali ;
   PM_Mp  = R.* PM_Cali ;
   % According to FMp = Mp + Bg, we have:
   NH3_FMp = NH3_Mp + NH3_Bg ;
   PM_FMp = PM_Mp + PM_Bg ;
   %% Save FMp into matrix and into Excel file
   NH3_FFMp(:,n) = NH3_FMp;
   PM_FFMp(:,n) = PM_FMp;
   filename = 'FMp_20m.xlsx';
   % For NH3
   sheet = 'R_NH3_20m';
   xlswrite(filename,NH3_FFMp,sheet,'C2');
   % For PM
   sheet = 'R_PM_20m';
   xlswrite(filename,PM_FFMp,sheet,'C2');
   %% Calculation of Insider ratio
   % NH3 TF = true or false, if insider = 1, outside = 0
   for m = 1:1:Loop_row
      % NH3_FMp_1 = a single number of NH3 value
      NH3_FMp_1 = NH3_FMp(m);
      NH3_2_1 = NH3_2(m);
      NH3_05_1 = NH3_05(m);
     if NH3_FMp_1 > NH3_2_1
        NH3_TF_1 = 0;
     elseif NH3_FMp_1 < NH3_05_1
           NH3_TF_1 = 0;
     else
        NH3_TF_1 = 1;
```

```
      end
      NH3_TF(m,n) =  NH3_TF_1;
    end
    % PM TF = true or false, if insider = 1, outside = 0
    for k = 1:1:Loop_row
       % NH3_FMp_1 = a single number of NH3 value
       PM_FMp_1 = PM_FMp(k);
       PM_2_1 = PM_2(k);
       PM_05_1 = PM_05(k);
      if PM_FMp_1 > PM_2_1
         PM_TF_1 = 0;
      elseif PM_FMp_1 < PM_05_1
           PM_TF_1 = 0;
      else
         PM_TF_1 = 1;
      end
      PM_TF(k,n) =  PM_TF_1;
    end
end
% get the sum of TF matrix, and calculate IS
    NH3_IS_pre = sum(NH3_TF);
    NH3_IS = NH3_IS_pre./Loop_row;
    PM_IS_pre = sum(PM_TF);
    PM_IS = PM_IS_pre./Loop_row;
    %% Print the results and deL
    deL = 0:0.6:35.4;
    filename = '40m_deL_vs_IS.xlsx';
    sheet = '40m';
    % Wrting title
    A = {'Ratio_R_NH3_40','Ratio_R_PM_40'};
    % Writing content
    B = [NH3_IS', PM_IS'];
    xlswrite(filename,A,sheet,'D1');
    xlswrite(filename,B,sheet,'D2');
    xlswrite(filename,deL',sheet,'A2');
    xlswrite(filename,'L',sheet,'A1');

    'ALL finish'
```

Appendix E - *FAC2* of NH_3 and PM, and the average

(full range)



Appendix F - Two-sided paired t-test

All p-values were less than 0.00001, therefore, they are significantly different.

(1). 20m NH_3: reflection and non-reflection

Difference Scores Calculations
Mean: -0.08
$\mu = 0$
$S2 = SS/df = 0.31/(60-1) = 0.01$
$S2M = S2/N = 0.01/60 = 0.00$
$SM = \sqrt{S2M} = \sqrt{0.00} = 0.01$
T-value Calculation
$t = (M - \mu)/SM = (-0.08 - 0)/0.01 = -8.11$
The value of t is -8.105271. The value of p is < 0.00001. The result is significant at $p \leq 0.01$.

(2). 20m PM: reflection and non-reflection

Difference Scores Calculations
Mean: -0.04
$\mu = 0$
$S2 = SS/df = 0.06/(60-1) = 0.00$
$S2M = S2/N = 0.00/60 = 0.00$
$SM = \sqrt{S2M} = \sqrt{0.00} = 0.00$
T-value Calculation
$t = (M - \mu)/SM = (-0.04 - 0)/0.00 = -8.76$
The value of t is -8.756310. The value of p is < 0.00001. The result is significant at $p \leq 0.01$.

(3). 40m NH_3: reflection and non-reflection

Difference Scores Calculations
Mean: -0.02
$\mu = 0$
$S2 = SS/df = 0.05/(60-1) = 0.00$
$S2M = S2/N = 0.00/60 = 0.00$
$SM = \sqrt{S2M} = \sqrt{0.00} = 0.00$
T-value Calculation
$t = (M - \mu)/SM = (-0.02 - 0)/0.00 = -5.25$
The value of t is -5.246372. The value of p is < 0.00001. The result is significant at $p \leq 0.01$.

(4). 40m PM: reflection and non-reflection

Difference Scores Calculations
Mean: -0.02
$\mu = 0$
$S2 = SS/df = 0.02/(60-1) = 0.00$
$S2M = S2/N = 0.00/60 = 0.00$
$SM = \sqrt{S2M} = \sqrt{0.00} = 0.00$
T-value Calculation
$t = (M - \mu)/SM = (-0.02 - 0)/0.00 = -8.54$
The value of t is -8.539516. The value of p is < 0.00001. The result is significant at $p \leq 0.01$

Appendix G - Model-predicted concentration of 20m when *L*=6.6m.

Unit: ug/m^3. It included R: reflection, and NR: non-reflection. T1-3 of PM was not predicted, since there was no observation from this sampler.

	Sampler	NH_3-R	NH_3-NR	PM-NR	PM-R		Sampler	NH_3-R	NH_3-NR	PM-NR	PM-R
N1	T1-1	3488.3	3488.3	364.4	364.4	N4	T1-1	1845.8	1845.8	699.9	699.9
	T1-2	394.6	413.0	60.0	58.2		T1-2	198.5	187.7	108.1	111.9
	T1-3	123.5	123.9				T1-3	108.1	98.0		
	T1-4	118.3	118.3	30.8	30.8		T1-4	96.2	91.0	73.5	75.4
	T2-1	1309.6	841.5	102.4	148.7		T2-1	758.7	485.3	214.3	311.9
	T2-2	977.4	697.9	88.2	115.9		T2-2	551.5	396.5	182.6	237.9
	T2-3	571.9	453.8	64.0	75.7		T2-3	309.1	250.6	130.5	151.4
	S2-4	302.2	263.3	45.2	49.0		S2-4	160.7	144.7	92.7	98.4
	S1	1013.6	660.8	84.5	119.5		S1	577.6	376.7	175.5	247.2
	S1	1013.6	660.8	84.5	119.5		S1	577.6	376.7	175.5	247.2
N2	T1-1	2803.7	2803.7	234.2	234.2	N5	T1-1	2195.2	2195.2	753.6	753.6
	T1-2	215.9	225.2	50.8	50.1		T1-2	266.5	272.3	166.7	164.9
	T1-3	63.4	63.4				T1-3	164.1	164.1		
	T1-4	62.7	62.7	39.2	39.2		T1-4	163.7	163.7	133.5	133.5
	T2-1	1107.3	684.7	83.5	113.5		T2-1	954.4	633.3	276.8	374.8
	T2-2	794.4	551.3	74.0	91.3		T2-2	711.2	529.5	245.2	300.6
	T2-3	424.8	330.4	58.2	65.0		T2-3	428.6	360.0	193.4	214.4
	S2-4	193.6	167.2	46.6	48.5		S2-4	256.4	237.9	156.2	161.8
	S1	832.7	520.5	71.8	94.0		S1	742.5	507.0	238.3	310.2
	S1	832.7	520.5	71.8	94.0		S1	742.5	507.0	238.3	310.2
D1	T1-1	3310.9	3310.9	346.6	346.6	D4	T1-1	2388.5	2388.5	2088.6	2088.6
	T1-2	894.9	1062.8	136.7	121.0		T1-2	529.1	618.4	556.2	478.9
	T1-3	163.7	174.4				T1-3	86.9	90.1		
	T1-4	127.2	127.3	49.3	49.3		T1-4	74.1	74.1	84.9	84.9
	T2-1	811.5	599.3	93.4	113.2		T2-1	631.9	444.5	405.6	567.8
	T2-2	712.7	553.7	89.1	104.0		T2-2	538.4	402.6	369.3	486.9
	T2-3	556.9	458.1	80.2	89.4		T2-3	396.8	317.4	295.6	364.3
	S2-4	400.6	348.7	70.0	74.8		S2-4	263.8	225.5	216.0	249.2
	S1	710.8	529.5	86.9	103.8		S1	539.0	382.6	352.0	487.4
	S1	710.8	529.5	86.9	103.8		S1	539.0	382.6	352.0	487.4
N3	T1-1	2837.4	2837.4	322.6	322.6	D5	T1-1	3341.6	3341.6	1115.7	1115.7
	T1-2	287.7	294.4	110.2	109.6		T1-2	544.6	637.4	231.9	201.5
	T1-3	164.9	164.9				T1-3	19.4	21.0		
	T1-4	164.7	164.7	99.4	99.4		T1-4	11.5	11.5	27.3	27.3
	T2-1	1221.2	790.3	151.6	187.6		T2-1	895.7	580.1	213.1	316.3
	T2-2	890.9	649.4	139.8	160.0		T2-2	729.5	507.5	189.4	262.0
	T2-3	510.4	421.2	120.8	128.2		T2-3	486.0	363.6	142.4	182.4
	S2-4	282.2	259.2	107.2	109.2		S2-4	269.8	215.9	94.1	111.7
	S1	934.5	619.9	137.4	163.6		S1	733.7	475.7	179.0	263.4
	S1	934.5	619.9	137.4	163.6		S1	733.7	475.7	179.0	263.4

Appendix H - Model-predicted concentration of 40m when *L*=6.6m.

Unit: ug/m^3. It includes R: reflection, and NR: non-reflection. T1-3 of PM was not predicted, since no observation from this sampler.

	Sampler	NH_3-R	NH_3-NR	PM-R	PM-NR		Sampler	NH_3-R	NH_3-NR	PM-R	PM-NR
N1	T1-1	3488.3	3488.3	364.4	364.4	N4	T1-1	1845.8	1845.8	699.9	699.9
	T1-2	365.2	379.0	55.3	56.6		T1-2	204.9	189.3	114.2	108.6
	T1-3	122.9	123.2				T1-3	111.7	102.4		
	T1-4	118.3	118.3	30.8	30.8		T1-4	93.2	90.1	74.3	73.2
	T2-1	1351.4	863.2	152.9	104.6		T2-1	766.8	491.8	314.8	216.6
	T2-2	992.1	707.8	117.3	89.2		T2-2	551.4	398.6	237.9	183.3
	T2-3	564.0	448.9	74.9	63.6		T2-3	304.2	248.1	149.6	129.6
	T2-4	290.8	254.6	47.9	44.3		T2-4	157.5	142.1	97.3	91.8
	T3-1	581.2	379.2	76.7	56.7		T3-1	341.6	225.3	163.0	121.5
	T3-2	530.9	360.5	71.7	54.8		T3-2	310.8	214.0	152.0	117.4
	T3-3	447.0	319.5	63.4	50.8		T3-3	259.9	189.4	133.8	108.6
	T3-4	354.5	268.5	54.2	45.7		T3-4	205.0	159.3	114.2	97.9
	S1	1034.7	670.9	121.5	85.5		S1	580.1	379.3	248.1	176.4
	S2	1034.7	670.9	121.5	85.5		S2	580.1	379.3	248.1	176.4
	S3	409.8	282.4	59.7	47.1		S3	238.3	167.8	126.1	101.0
	S4	409.7	282.4	59.7	47.1		S4	238.3	167.8	126.1	101.0
N2	T1-1	2803.7	2803.7	234.2	234.2	N5	T1-1	2195.2	2195.2	753.6	753.6
	T1-2	198.4	205.5	48.8	49.4		T1-2	253.5	258.0	160.9	162.3
	T1-3	63.3	63.3				T1-3	163.9	163.9		
	T1-4	62.7	62.7	39.2	39.2		T1-4	163.7	163.7	133.5	133.5
	T2-1	1136.9	700.5	115.6	84.6		T2-1	976.1	644.9	381.5	280.4
	T2-2	803.2	557.9	91.9	74.4		T2-2	717.6	534.3	302.6	246.6
	T2-3	417.8	326.3	64.5	57.9		T2-3	423.5	357.0	212.8	192.5
	T2-4	185.4	161.1	47.9	46.2		T2-4	250.4	233.5	160.0	154.8
	T3-1	471.2	287.8	68.3	55.2		T3-1	474.5	334.1	228.4	185.5
	T3-2	423.6	270.5	64.9	54.0		T3-2	437.2	320.6	217.0	181.4
	T3-3	345.0	232.8	59.3	51.3		T3-3	375.9	291.3	198.3	172.5
	T3-4	259.8	186.6	53.2	48.0		T3-4	310.2	255.7	178.2	161.6
	S1	846.9	527.6	95.0	72.3		S1	752.9	512.2	313.4	239.9
	S2	846.9	527.6	95.0	72.3		S2	752.9	512.2	313.4	239.9
	S3	311.3	199.6	56.9	48.9		S3	350.2	265.9	190.4	164.7
	S4	311.3	199.6	56.9	48.9		S4	350.2	265.9	190.4	164.7
D1	T1-1	3310.9	3310.9	346.6	346.6	D4	T1-1	2388.5	2388.5	2088.6	2088.6
	T1-2	889.5	1054.8	120.5	135.9		T1-2	531.8	621.2	481.2	558.6
	T1-3	163.2	173.7				T1-3	87.5	90.8		
	T1-4	127.2	127.3	49.3	49.3		T1-4	74.1	74.1	84.9	84.9
	T2-1	815.1	601.0	113.5	93.5		T2-1	631.1	444.3	567.1	405.4
	T2-2	714.9	554.9	104.2	89.2		T2-2	537.6	402.4	486.2	369.2
	T2-3	557.4	458.2	89.5	80.2		T2-3	396.3	317.3	363.9	295.5
	T2-4	400.0	348.0	74.8	69.9		T2-4	263.8	225.6	249.1	216.1
	T3-1	361.7	283.6	71.2	63.9		T3-1	266.7	197.4	251.7	191.7
	T3-2	350.1	278.6	70.1	63.4		T3-2	255.6	192.9	242.0	187.7
	T3-3	328.7	266.8	68.1	62.3		T3-3	235.4	182.1	224.5	178.4
	T3-4	301.0	249.9	65.5	60.8		T3-4	209.8	167.0	202.4	165.3
	S1	713.1	530.5	104.0	87.0		S1	538.3	382.4	486.8	351.8
	S2	713.1	530.5	104.0	87.0		S2	538.3	382.4	486.8	351.8
	S3	315.1	252.5	66.9	61.0		S3	223.3	169.6	214.1	167.6
	S4	315.1	252.5	66.9	61.0		S4	223.3	169.6	214.1	167.6
N3	T1-1	2837.4	2837.4	322.6	322.6	D5	T1-1	3341.6	3341.6	1115.7	1115.7
	T1-2	272.2	277.3	108.3	108.8		T1-2	507.7	589.4	189.5	216.2
	T1-3	164.8	164.8				T1-3	17.5	18.7		
	T1-4	164.7	164.7	99.4	99.4		T1-4	11.5	11.5	27.3	27.3
	T2-1	1248.9	805.2	189.9	152.8		T2-1	924.6	593.1	325.7	217.4
	T2-2	898.6	655.5	160.6	140.3		T2-2	746.0	515.5	267.4	192.0
	T2-3	503.4	417.1	127.6	120.4		T2-3	487.9	363.6	183.0	142.4
	T2-4	274.5	253.5	108.5	106.8		T2-4	263.7	210.7	109.7	92.4
	T3-1	580.7	392.0	134.1	118.3		T3-1	332.7	207.3	132.3	91.3

	T3-2	530.0	373.6	129.9	116.8		T3-2	310.8	198.7	125.1	88.5
	T3-3	446.8	333.9	122.9	113.5		T3-3	271.6	178.6	112.3	81.9
	T3-4	358.0	285.9	115.5	109.5		T3-4	223.2	151.1	96.5	72.9
	S1	947.5	626.5	164.7	137.9		S1	751.9	482.7	269.3	181.3
	S2	947.5	626.5	164.7	137.9		S2	751.9	482.7	269.3	181.3
	S3	412.2	299.8	120.0	110.6		S3	249.6	156.6	105.1	74.7
	S4	412.2	299.8	120.0	110.6		S4	249.6	156.6	105.1	74.7

Appendix I - Observed concentration of NH_3 and PM..

Unit: ug/m^3. Bg refers to background concentration

NH_3

Sampler	N1	N2	D1	N3	N4	N5	D4	D5
T1-1	3488.3	2803.7	3310.9	2837.4	1845.8	2195.2	2388.5	3341.6
T1-2	217.1	439.6	352.2	388.1	292.4	223.9	286.0	1246.9
T1-3	201.2	133.4	191.6	123.5	228.4	130.7	172.8	582.0
T1-4	168.5	70.4	117.6	227.1	229.9	41.2	110.1	245.2
T2-1	2248.4	687.2	1451.2	1249.6	1123.7	939.1	900.0	139.4
T2-2	1372.0	406.9	725.6	742.4	737.4	508.0	465.2	116.6
T2-3	1373.6	162.8	275.8	430.0	352.4	205.1	194.4	60.6
T2-4	471.0	64.8	85.9	211.0	154.7	78.3	94.9	31.5
T3-1	636.8	92.3	227.5	219.1	556.1	280.3	212.4	9.7
T3-2	563.1	85.2	205.0	186.0	472.9	175.0	171.3	7.8
T3-3	560.3	74.0	154.3	159.0	312.2	99.1	121.6	6.9
T3-4	403.9	49.7	104.3	116.1	177.0	60.7	91.3	7.8
S1	1986.2	746.7	711.5	668.9	1100.9	396.7	439.3	118.7
S2	1397.6	612.9	1578.0	1330.5	1005.6	1022.5	861.7	131.5
S3	549.7	127.5	144.4	170.5	448.8	130.7	118.0	11.5
S4	400.6	83.8	272.9	232.3	452.6	282.6	217.5	14.2
Bg	118.3	62.7	126.8	164.7	79.8	163.7	74.0	11.5

PM

Sampler	N1	N2	D1	N3	N4	N5	D4	D5
T1-1	364.4	234.2	346.6	322.6	699.9	753.6	2088.6	1115.7
T1-2	89.9	89.5	91.6	150.2	211.3	191.2	271.6	803.6
T1-3								
T1-4	79.0	34.0	36.3	51.1	183.1	43.3	123.2	150.6
T2-1	467.9	148.9	367.8	251.4	599.0	482.4	769.2	114.4
T2-2	363.6	103.8	252.5	212.9	418.3	333.5	454.1	67.9
T2-3	227.9	48.8	88.0	117.4	211.1	122.4	209.7	47.5
T2-4	163.9	35.6	42.2	71.3	134.9	56.1	112.9	33.4
T3-1	219.2	45.4	88.1	73.2	370.0	162.5	233.6	26.0
T3-2	270.4	44.2	81.1	69.5	307.8	130.4	206.4	25.5
T3-3	233.6	40.4	51.0	63.7	205.2	79.3	178.3	23.7
T3-4	176.5	34.3	43.7	50.4	115.8	46.4	119.0	24.6
S1	386.1	147.2	171.1	119.5	541.3	204.5	409.4	80.7
S2	410.4	131.2	408.4	341.8	418.3	546.2	794.1	77.1
S3	229.1	52.2	55.9	58.9	319.9	82.0	132.7	31.8
S4	179.2	52.6	113.5	104.4	341.0	255.9	295.9	35.9
Bg	30.8	39.2	49.3	99.4	69.5	133.5	84.9	27.3

Appendix J - Details of condition scenario. "1" means yes, this sampler/experiment was used in this condition.

	A1-1	A1-2	A1-3	A1-4	A1-5	A1-6	A1-7	A2-1	A2-2	A2-3	A2-4	A2-5	A2-6	A2-7
SPLS (Sampler Scenario)														
T1-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T1-2	1	1	1		1	1		1	1	1		1	1	
T1-3	1	1			1			1	1			1		
T1-4	1	1			1			1	1			1		
T2-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
BGKS (Background Scenario)														
Bg	1	1	1	1	1	1	1	1	1	1	1	1	1	1
WSS (Wind Speed Scenario)														
T1-1	1	1	1	1	1	1	1							
T1-2	1	1	1	1	1	1	1							
T1-3	1	1	1	1	1	1	1							
T1-4	1	1	1	1	1	1	1							
T2-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EXPS (Experiment Scenario)														
DE01	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE02	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE03	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE04	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE05	1					1	1	1					1	1
DE06	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE07	1					1	1	1					1	1
DE08	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE09	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE10	1	1	1	1		1	1	1	1	1	1		1	1

Appendix J (cont.)

	A3=A1	A4-1	A4-2	A4-3	A4-4	A4-5	A4-6	A4-7	B1-2	B2-2	C1-2	C2-2	D1-2	D2-2
SPLS (Sampler Scenario)														
T1-1		1	1	1	1	1	1	1	1	1	1	1	1	1
T1-2		1	1	1		1	1		1	1	1	1	1	1
T1-3		1	1			1			1	1	1	1	1	1
T1-4		1	1			1			1	1	1	1	1	1
T2-1		1	1	1	1	1	1	1	1	1	1	1	1	1
T2-2		1	1	1	1	1	1	1	1	1	1	1	1	1
T2-3		1	1	1	1	1	1	1	1	1	1	1	1	1
T2-4		1	1	1	1	1	1	1	1	1	1	1	1	1
T3-1		1	1	1	1	1	1	1	1	1	1	1	1	1
T3-2		1	1	1	1	1	1	1	1	1	1	1	1	1
T3-3		1	1	1	1	1	1	1	1	1	1	1	1	1
T3-4		1	1	1	1	1	1	1	1	1	1	1	1	1
S1		1	1	1	1	1	1	1	1	1	1	1	1	1
S2		1	1	1	1	1	1	1	1	1	1	1	1	1
S3		1	1	1	1	1	1	1	1	1	1	1	1	1
S4		1	1	1	1	1	1	1	1	1	1	1	1	1
BGKS (Background Scenario)														
Bg		1	1	1	1	1	1	1	1	1	1	1	1	1
WSS (Wind Speed Scenario)														
T1-1	1	1	1	1	1	1	1	1	1		1		1	
T1-2	1	1	1	1	1	1	1	1	1		1			
T1-3	1								1					
T1-4														
T2-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-2	1	1	1	1	1	1	1	1	1	1	1	1		
T2-3	1	1	1	1	1	1	1	1	1	1				
T2-4	1	1	1	1	1	1	1	1						
T3-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-2	1	1	1	1	1	1	1	1	1	1	1	1		
T3-3	1	1	1	1	1	1	1	1	1	1				
T3-4	1	1	1	1	1	1	1	1						
S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EXPS (Experiment Scenario)														
DE01		1	1	1	1	1	1	1	1	1	1	1	1	1
DE02		1	1	1	1	1	1	1	1	1	1	1	1	1
DE03		1	1	1	1	1	1	1	1	1	1	1	1	1
DE04		1	1	1	1	1	1	1	1	1	1	1	1	1
DE05		1					1	1						
DE06		1	1	1	1	1	1	1	1	1	1	1	1	1
DE07		1					1	1						
DE08		1	1	1	1	1	1	1	1	1	1	1	1	1
DE09		1	1	1	1	1	1	1	1	1	1	1	1	1
DE10		1	1	1	1		1	1	1	1	1	1	1	1

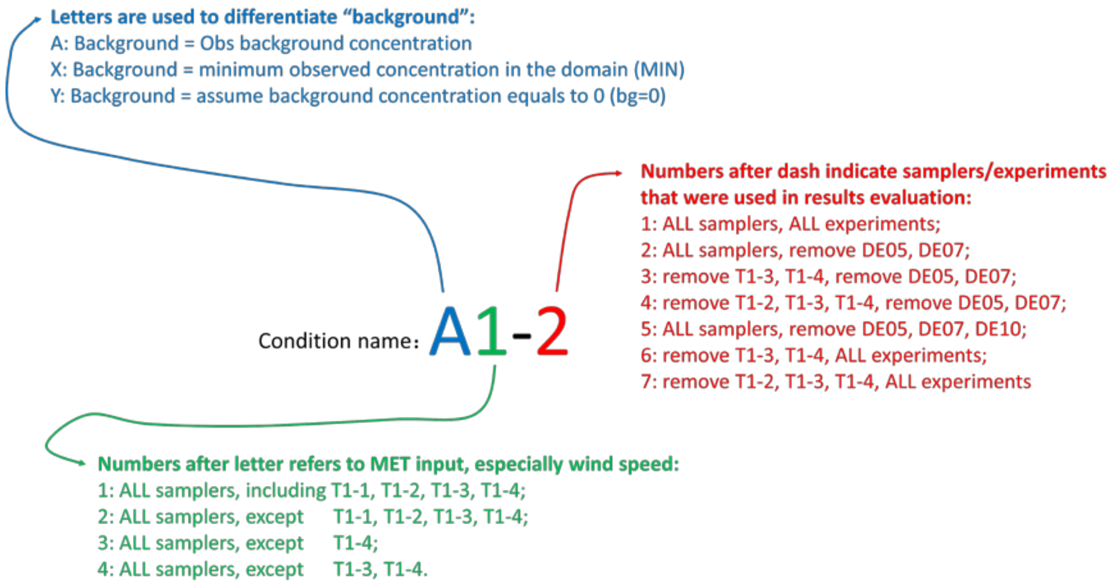
Appendix J (cont.)

	X1-1	X1-2	X1-3	X1-4	X1-5	X1-6	X1-7	X2-1	X2-2	X2-3	X2-4	X2-5	X2-6	X2-7
SPLS (Sampler Scenario)														
T1-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T1-2	1	1	1		1	1		1	1	1		1	1	
T1-3	1	1			1			1	1			1		
T1-4	1	1			1			1	1			1		
T2-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
BGKS (Background Scenario)														
Bg	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
WSS (Wind Speed Scenario)														
T1-1	1	1	1	1	1	1	1							
T1-2	1	1	1	1	1	1	1							
T1-3	1	1	1	1	1	1	1							
T1-4	1	1	1	1	1	1	1							
T2-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EXPS (Experiment Scenario)														
DE01	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE02	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE03	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE04	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE05	1					1	1	1					1	1
DE06	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE07	1					1	1	1					1	1
DE08	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE09	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE10	1	1	1	1		1	1	1	1	1	1		1	1

Appendix J (cont.)

	Y1-1	Y1-2	Y1-3	Y1-4	Y1-5	Y1-6	Y1-7	Y2-1	Y2-2	Y2-3	Y2-4	Y2-5	Y2-6	Y2-7
SPLS (Sampler Scenario)														
T1-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T1-2	1	1	1		1	1		1	1	1		1	1	
T1-3	1	1			1			1	1			1		
T1-4	1	1			1			1	1			1		
T2-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
BGKS (Background Scenario)														
Bg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WSS (Wind Speed Scenario)														
T1-1	1	1	1	1	1	1	1							
T1-2	1	1	1	1	1	1	1							
T1-3	1	1	1	1	1	1	1							
T1-4	1	1	1	1	1	1	1							
T2-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3-4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EXPS (Experiment Scenario)														
DE01	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE02	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE03	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE04	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE05	1					1	1	1					1	1
DE06	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE07	1					1	1	1					1	1
DE08	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE09	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DE10	1	1	1	1		1	1	1	1	1	1		1	1

Appendix K - Scenario names explanation



Appendix L – Average *FAC2* of *L* ranging 0~35.4 m and different condition scenarios

L[m]	0.00	0.60	1.20	1.80	2.40	3.00	3.60	4.20	4.80	5.40
A1-1	0.44	0.51	0.52	0.51	0.51	0.51	0.52	0.52	0.53	0.53
A1-2	0.51	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.61
A1-3	0.50	0.59	0.61	0.60	0.60	0.60	0.61	0.62	0.62	0.62
A1-4	0.51	0.62	0.63	0.63	0.62	0.62	0.62	0.62	0.63	0.62
A1-5	0.57	0.66	0.68	0.67	0.67	0.67	0.68	0.69	0.69	0.69
A1-6	0.43	0.50	0.52	0.51	0.51	0.51	0.52	0.52	0.53	0.53
A1-7	0.43	0.52	0.53	0.52	0.52	0.52	0.52	0.52	0.52	0.52
A2-1	0.43	0.50	0.53	0.52	0.51	0.52	0.52	0.52	0.52	0.53
A2-2	0.50	0.59	0.61	0.60	0.60	0.60	0.60	0.61	0.61	0.61
A2-3	0.49	0.59	0.62	0.61	0.60	0.61	0.61	0.62	0.62	0.62
A2-4	0.50	0.61	0.64	0.63	0.63	0.63	0.62	0.63	0.63	0.62
A2-5	0.56	0.66	0.69	0.68	0.67	0.68	0.68	0.69	0.69	0.69
A2-6	0.42	0.50	0.53	0.52	0.51	0.52	0.52	0.52	0.52	0.53
A2-7	0.42	0.51	0.54	0.53	0.52	0.53	0.52	0.52	0.52	0.52
A4-1	0.45	0.51	0.52	0.52	0.51	0.51	0.52	0.52	0.53	0.53
A4-2	0.53	0.59	0.60	0.60	0.59	0.59	0.60	0.61	0.61	0.62
A4-3	0.52	0.60	0.61	0.61	0.60	0.60	0.61	0.62	0.62	0.63
A4-4	0.54	0.62	0.63	0.63	0.62	0.62	0.62	0.62	0.63	0.63
A4-5	0.59	0.67	0.68	0.68	0.67	0.67	0.68	0.69	0.69	0.70
A4-6	0.44	0.51	0.52	0.51	0.51	0.51	0.51	0.52	0.53	0.53
A4-7	0.45	0.52	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.52
B1-2	0.55	0.61	0.60	0.60	0.59	0.60	0.60	0.60	0.61	0.61
B2-2	0.55	0.61	0.60	0.60	0.59	0.60	0.60	0.60	0.61	0.61
C1-2	0.58	0.60	0.59	0.58	0.60	0.60	0.60	0.60	0.60	0.61
C2-2	0.57	0.61	0.59	0.59	0.60	0.60	0.60	0.59	0.60	0.60
D1-2	0.59	0.58	0.58	0.58	0.59	0.60	0.59	0.59	0.60	0.61
D2-2	0.59	0.58	0.58	0.58	0.59	0.60	0.59	0.59	0.60	0.61
X1-1	0.47	0.58	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.60
X1-2	0.55	0.68	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
X1-3	0.52	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.68	0.68
X1-4	0.54	0.70	0.72	0.72	0.71	0.71	0.70	0.69	0.69	0.69
X1-5	0.62	0.77	0.78	0.78	0.77	0.78	0.78	0.78	0.78	0.78
X1-6	0.44	0.57	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
X1-7	0.46	0.60	0.61	0.61	0.60	0.60	0.60	0.59	0.59	0.59
X2-1	0.46	0.57	0.59	0.59	0.59	0.59	0.60	0.59	0.59	0.60
X2-2	0.54	0.67	0.69	0.69	0.69	0.69	0.70	0.69	0.68	0.69
X2-3	0.51	0.66	0.68	0.68	0.68	0.68	0.69	0.68	0.67	0.68
X2-4	0.53	0.69	0.71	0.72	0.72	0.71	0.71	0.70	0.69	0.69
X2-5	0.60	0.75	0.78	0.78	0.78	0.78	0.79	0.78	0.77	0.78
X2-6	0.43	0.56	0.58	0.58	0.58	0.58	0.59	0.58	0.57	0.58
X2-7	0.45	0.58	0.61	0.61	0.61	0.60	0.60	0.59	0.58	0.59
Y1-1	0.38	0.43	0.41	0.41	0.41	0.40	0.42	0.41	0.42	0.43
Y1-2	0.44	0.47	0.44	0.44	0.44	0.44	0.45	0.46	0.47	0.47
Y1-3	0.49	0.53	0.50	0.49	0.49	0.49	0.50	0.51	0.52	0.53
Y1-4	0.52	0.57	0.53	0.53	0.53	0.52	0.54	0.54	0.55	0.54
Y1-5	0.49	0.52	0.49	0.48	0.48	0.48	0.50	0.51	0.53	0.53
Y1-6	0.42	0.48	0.46	0.45	0.45	0.45	0.46	0.46	0.47	0.48
Y1-7	0.45	0.52	0.49	0.49	0.49	0.48	0.50	0.48	0.49	0.49
Y2-1	0.37	0.44	0.43	0.41	0.40	0.41	0.42	0.42	0.42	0.43
Y2-2	0.43	0.48	0.46	0.44	0.44	0.44	0.45	0.46	0.46	0.47
Y2-3	0.47	0.53	0.52	0.49	0.49	0.49	0.50	0.51	0.52	0.53
Y2-4	0.51	0.57	0.56	0.53	0.52	0.53	0.54	0.55	0.54	0.54
Y2-5	0.47	0.53	0.51	0.48	0.48	0.49	0.50	0.52	0.52	0.53
Y2-6	0.41	0.48	0.48	0.46	0.45	0.45	0.46	0.46	0.46	0.48
Y2-7	0.44	0.52	0.52	0.49	0.48	0.49	0.50	0.50	0.49	0.49

Appendix L (cont.)

L[m]	6.00	6.60	7.20	7.80	8.40	9.00	9.60	10.20	10.80	11.40
A1-1	0.53	0.54	0.53	0.53	0.53	0.53	0.52	0.51	0.51	0.51
A1-2	0.61	0.62	0.61	0.61	0.62	0.61	0.61	0.61	0.61	0.60
A1-3	0.62	0.62	0.61	0.62	0.62	0.61	0.61	0.60	0.60	0.60
A1-4	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60
A1-5	0.69	0.70	0.69	0.69	0.69	0.69	0.69	0.68	0.67	0.67
A1-6	0.53	0.53	0.52	0.53	0.53	0.52	0.51	0.51	0.51	0.50
A1-7	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.50	0.50	0.50
A2-1	0.53	0.54	0.53	0.53	0.53	0.52	0.51	0.50	0.50	0.50
A2-2	0.61	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59
A2-3	0.62	0.62	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59
A2-4	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.59	0.59	0.59
A2-5	0.69	0.70	0.69	0.68	0.68	0.68	0.67	0.66	0.66	0.66
A2-6	0.53	0.53	0.52	0.52	0.52	0.52	0.51	0.50	0.50	0.50
A2-7	0.51	0.51	0.51	0.51	0.51	0.50	0.50	0.50	0.50	0.50
A4-1	0.54	0.54	0.53	0.53	0.53	0.53	0.52	0.51	0.51	0.51
A4-2	0.62	0.62	0.61	0.61	0.62	0.62	0.61	0.60	0.60	0.60
A4-3	0.63	0.62	0.62	0.62	0.62	0.62	0.61	0.60	0.60	0.60
A4-4	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60
A4-5	0.70	0.70	0.69	0.69	0.69	0.69	0.68	0.67	0.67	0.67
A4-6	0.54	0.53	0.53	0.53	0.53	0.52	0.51	0.50	0.50	0.50
A4-7	0.52	0.51	0.51	0.51	0.51	0.51	0.51	0.50	0.50	0.50
B1-2	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60
B2-2	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60
C1-2	0.62	0.61	0.61	0.60	0.60	0.60	0.60	0.59	0.60	0.58
C2-2	0.61	0.60	0.61	0.60	0.60	0.60	0.60	0.59	0.59	0.58
D1-2	0.60	0.60	0.60	0.59	0.58	0.57	0.58	0.57	0.57	0.57
D2-2	0.60	0.60	0.60	0.59	0.58	0.57	0.58	0.57	0.57	0.57
X1-1	0.60	0.60	0.60	0.60	0.60	0.60	0.59	0.59	0.59	0.59
X1-2	0.68	0.69	0.69	0.69	0.70	0.69	0.68	0.68	0.68	0.68
X1-3	0.67	0.68	0.67	0.68	0.69	0.67	0.67	0.67	0.67	0.67
X1-4	0.69	0.69	0.69	0.69	0.69	0.67	0.67	0.67	0.67	0.67
X1-5	0.77	0.78	0.78	0.78	0.78	0.77	0.77	0.77	0.76	0.76
X1-6	0.58	0.59	0.59	0.59	0.59	0.58	0.58	0.57	0.57	0.57
X1-7	0.58	0.58	0.58	0.58	0.58	0.57	0.57	0.57	0.57	0.57
X2-1	0.60	0.60	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.59
X2-2	0.68	0.69	0.68	0.69	0.69	0.68	0.68	0.68	0.68	0.68
X2-3	0.67	0.68	0.67	0.68	0.68	0.67	0.67	0.67	0.67	0.67
X2-4	0.69	0.69	0.69	0.69	0.68	0.67	0.67	0.67	0.67	0.67
X2-5	0.77	0.78	0.77	0.78	0.78	0.77	0.77	0.77	0.76	0.76
X2-6	0.58	0.59	0.58	0.59	0.59	0.58	0.58	0.57	0.57	0.57
X2-7	0.58	0.58	0.58	0.58	0.58	0.57	0.57	0.57	0.57	0.57
Y1-1	0.43	0.44	0.44	0.44	0.44	0.45	0.46	0.47	0.48	0.46
Y1-2	0.48	0.48	0.48	0.48	0.49	0.49	0.50	0.52	0.53	0.51
Y1-3	0.53	0.53	0.53	0.54	0.54	0.54	0.55	0.57	0.58	0.57
Y1-4	0.55	0.55	0.54	0.55	0.55	0.54	0.55	0.57	0.58	0.56
Y1-5	0.54	0.54	0.54	0.54	0.54	0.54	0.56	0.58	0.59	0.57
Y1-6	0.48	0.49	0.49	0.49	0.49	0.49	0.50	0.51	0.52	0.51
Y1-7	0.49	0.50	0.48	0.49	0.49	0.48	0.49	0.50	0.51	0.50
Y2-1	0.44	0.43	0.44	0.44	0.45	0.45	0.46	0.47	0.48	0.46
Y2-2	0.48	0.47	0.48	0.48	0.49	0.49	0.50	0.51	0.53	0.51
Y2-3	0.54	0.53	0.53	0.54	0.54	0.54	0.55	0.56	0.58	0.57
Y2-4	0.56	0.55	0.55	0.55	0.55	0.55	0.55	0.56	0.57	0.56
Y2-5	0.54	0.53	0.54	0.54	0.55	0.55	0.56	0.57	0.59	0.57
Y2-6	0.49	0.48	0.49	0.49	0.49	0.49	0.50	0.50	0.52	0.50
Y2-7	0.50	0.49	0.49	0.49	0.49	0.49	0.49	0.50	0.51	0.50

Appendix L (cont.)

L[m]	12.00	12.60	13.20	13.80	14.40	15.00	15.60	16.20	16.80	17.40
A1-1	0.50	0.50	0.48	0.48	0.48	0.48	0.47	0.46	0.45	0.45
A1-2	0.59	0.60	0.58	0.58	0.57	0.57	0.56	0.55	0.54	0.53
A1-3	0.59	0.59	0.58	0.58	0.58	0.57	0.57	0.56	0.55	0.55
A1-4	0.59	0.60	0.59	0.59	0.59	0.58	0.58	0.57	0.57	0.57
A1-5	0.66	0.66	0.64	0.64	0.63	0.63	0.61	0.60	0.58	0.58
A1-6	0.50	0.50	0.49	0.49	0.49	0.48	0.48	0.47	0.46	0.46
A1-7	0.50	0.50	0.49	0.49	0.49	0.49	0.48	0.48	0.48	0.48
A2-1	0.50	0.49	0.48	0.48	0.48	0.48	0.47	0.46	0.45	0.45
A2-2	0.59	0.58	0.58	0.58	0.57	0.57	0.56	0.55	0.54	0.53
A2-3	0.58	0.58	0.58	0.58	0.58	0.57	0.57	0.56	0.55	0.55
A2-4	0.59	0.59	0.58	0.59	0.59	0.58	0.58	0.57	0.57	0.57
A2-5	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.60	0.59	0.58
A2-6	0.49	0.49	0.49	0.49	0.49	0.48	0.48	0.47	0.46	0.46
A2-7	0.49	0.49	0.49	0.49	0.49	0.49	0.48	0.48	0.48	0.48
A4-1	0.50	0.49	0.49	0.49	0.48	0.48	0.47	0.46	0.45	0.45
A4-2	0.59	0.58	0.58	0.58	0.57	0.57	0.56	0.54	0.54	0.53
A4-3	0.58	0.58	0.58	0.58	0.58	0.58	0.57	0.56	0.55	0.55
A4-4	0.59	0.59	0.59	0.59	0.59	0.59	0.58	0.57	0.57	0.57
A4-5	0.65	0.65	0.64	0.64	0.63	0.63	0.61	0.60	0.58	0.58
A4-6	0.49	0.49	0.49	0.49	0.49	0.49	0.48	0.47	0.46	0.46
A4-7	0.49	0.50	0.50	0.50	0.49	0.49	0.48	0.48	0.48	0.48
B1-2	0.59	0.58	0.58	0.57	0.57	0.57	0.54	0.54	0.53	0.53
B2-2	0.59	0.58	0.58	0.57	0.57	0.57	0.54	0.54	0.53	0.53
C1-2	0.57	0.57	0.57	0.57	0.55	0.54	0.54	0.53	0.52	0.54
C2-2	0.57	0.57	0.57	0.56	0.55	0.54	0.54	0.53	0.53	0.53
D1-2	0.56	0.56	0.55	0.54	0.53	0.52	0.53	0.54	0.53	0.52
D2-2	0.56	0.56	0.55	0.54	0.53	0.52	0.53	0.54	0.53	0.52
X1-1	0.58	0.58	0.58	0.58	0.57	0.57	0.55	0.54	0.53	0.52
X1-2	0.68	0.68	0.67	0.67	0.66	0.66	0.64	0.63	0.62	0.61
X1-3	0.66	0.66	0.65	0.65	0.64	0.64	0.63	0.62	0.61	0.61
X1-4	0.67	0.67	0.67	0.67	0.66	0.66	0.65	0.64	0.63	0.63
X1-5	0.75	0.75	0.74	0.74	0.73	0.73	0.71	0.69	0.68	0.67
X1-6	0.56	0.56	0.55	0.55	0.55	0.54	0.54	0.53	0.52	0.51
X1-7	0.57	0.57	0.57	0.57	0.56	0.56	0.55	0.54	0.53	0.53
X2-1	0.59	0.58	0.58	0.58	0.57	0.57	0.55	0.54	0.53	0.53
X2-2	0.68	0.67	0.67	0.67	0.66	0.66	0.64	0.63	0.62	0.62
X2-3	0.66	0.65	0.65	0.65	0.64	0.64	0.63	0.62	0.62	0.61
X2-4	0.67	0.66	0.66	0.67	0.66	0.66	0.65	0.64	0.63	0.63
X2-5	0.76	0.74	0.74	0.74	0.73	0.73	0.71	0.69	0.69	0.67
X2-6	0.56	0.55	0.55	0.55	0.55	0.54	0.53	0.53	0.52	0.51
X2-7	0.57	0.56	0.56	0.57	0.56	0.56	0.55	0.54	0.54	0.53
Y1-1	0.46	0.46	0.46	0.46	0.46	0.45	0.45	0.46	0.46	0.46
Y1-2	0.52	0.51	0.52	0.52	0.53	0.53	0.52	0.52	0.53	0.53
Y1-3	0.57	0.55	0.56	0.55	0.55	0.54	0.54	0.54	0.54	0.54
Y1-4	0.56	0.55	0.56	0.56	0.56	0.55	0.55	0.55	0.55	0.55
Y1-5	0.58	0.56	0.57	0.57	0.58	0.58	0.58	0.57	0.58	0.58
Y1-6	0.50	0.49	0.49	0.48	0.47	0.47	0.46	0.46	0.46	0.46
Y1-7	0.49	0.48	0.49	0.49	0.48	0.47	0.47	0.47	0.47	0.47
Y2-1	0.46	0.45	0.46	0.46	0.46	0.45	0.45	0.45	0.46	0.45
Y2-2	0.52	0.51	0.51	0.52	0.53	0.53	0.52	0.53	0.53	0.53
Y2-3	0.57	0.55	0.55	0.55	0.54	0.54	0.54	0.54	0.54	0.54
Y2-4	0.56	0.54	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Y2-5	0.57	0.56	0.56	0.57	0.58	0.58	0.58	0.58	0.58	0.58
Y2-6	0.50	0.49	0.49	0.48	0.47	0.47	0.46	0.46	0.46	0.46
Y2-7	0.49	0.48	0.48	0.48	0.48	0.47	0.47	0.47	0.47	0.47

Appendix L (cont.)

L[m]	18.00	18.60	19.20	19.80	20.40	21.00	21.60	22.20	22.80	23.40
A1-1	0.44	0.45	0.44	0.45	0.45	0.44	0.44	0.43	0.43	0.43
A1-2	0.53	0.53	0.53	0.53	0.53	0.53	0.52	0.52	0.52	0.51
A1-3	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.53	0.54	0.54
A1-4	0.56	0.56	0.56	0.56	0.56	0.56	0.55	0.55	0.56	0.56
A1-5	0.57	0.58	0.57	0.58	0.58	0.57	0.57	0.56	0.57	0.56
A1-6	0.46	0.45	0.45	0.46	0.46	0.45	0.45	0.45	0.45	0.45
A1-7	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
A2-1	0.44	0.44	0.44	0.44	0.44	0.44	0.43	0.44	0.43	0.43
A2-2	0.53	0.53	0.53	0.53	0.53	0.53	0.52	0.52	0.52	0.51
A2-3	0.54	0.54	0.54	0.54	0.54	0.54	0.53	0.54	0.54	0.54
A2-4	0.56	0.56	0.56	0.56	0.56	0.55	0.55	0.56	0.56	0.56
A2-5	0.57	0.57	0.57	0.57	0.57	0.57	0.56	0.57	0.57	0.56
A2-6	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
A2-7	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
A4-1	0.44	0.45	0.44	0.44	0.44	0.44	0.43	0.43	0.44	0.43
A4-2	0.53	0.53	0.53	0.53	0.53	0.53	0.52	0.51	0.52	0.51
A4-3	0.54	0.54	0.54	0.54	0.54	0.54	0.53	0.53	0.54	0.54
A4-4	0.56	0.56	0.56	0.56	0.56	0.55	0.55	0.55	0.57	0.56
A4-5	0.57	0.58	0.57	0.57	0.57	0.57	0.56	0.56	0.57	0.56
A4-6	0.45	0.45	0.45	0.45	0.46	0.45	0.45	0.45	0.46	0.45
A4-7	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.48	0.47
B1-2	0.53	0.53	0.53	0.53	0.52	0.52	0.51	0.51	0.51	0.51
B2-2	0.53	0.53	0.53	0.53	0.52	0.52	0.51	0.51	0.51	0.51
C1-2	0.54	0.53	0.53	0.51	0.51	0.51	0.51	0.51	0.50	0.50
C2-2	0.54	0.53	0.52	0.51	0.51	0.51	0.51	0.50	0.50	0.49
D1-2	0.52	0.51	0.51	0.51	0.51	0.50	0.50	0.50	0.50	0.49
D2-2	0.52	0.51	0.51	0.51	0.51	0.50	0.50	0.50	0.50	0.49
X1-1	0.52	0.51	0.51	0.51	0.51	0.51	0.50	0.49	0.49	0.49
X1-2	0.61	0.61	0.60	0.60	0.60	0.60	0.59	0.58	0.58	0.58
X1-3	0.61	0.61	0.60	0.60	0.60	0.60	0.61	0.60	0.60	0.60
X1-4	0.63	0.63	0.62	0.63	0.63	0.63	0.63	0.63	0.63	0.63
X1-5	0.67	0.66	0.65	0.66	0.65	0.65	0.65	0.64	0.64	0.64
X1-6	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.50	0.51
X1-7	0.53	0.53	0.53	0.53	0.53	0.53	0.54	0.53	0.53	0.53
X2-1	0.52	0.52	0.51	0.51	0.51	0.51	0.51	0.49	0.49	0.49
X2-2	0.61	0.61	0.60	0.60	0.60	0.60	0.60	0.58	0.58	0.58
X2-3	0.61	0.61	0.60	0.60	0.60	0.60	0.61	0.60	0.60	0.60
X2-4	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
X2-5	0.67	0.66	0.66	0.66	0.65	0.65	0.65	0.64	0.64	0.64
X2-6	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.50
X2-7	0.53	0.53	0.53	0.53	0.53	0.53	0.54	0.53	0.53	0.53
Y1-1	0.45	0.47	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44
Y1-2	0.52	0.54	0.55	0.54	0.54	0.54	0.53	0.53	0.52	0.52
Y1-3	0.55	0.56	0.57	0.57	0.56	0.57	0.56	0.56	0.55	0.55
Y1-4	0.56	0.57	0.59	0.58	0.58	0.59	0.58	0.58	0.57	0.57
Y1-5	0.57	0.59	0.59	0.59	0.58	0.59	0.58	0.58	0.57	0.57
Y1-6	0.47	0.48	0.49	0.48	0.48	0.48	0.48	0.48	0.47	0.47
Y1-7	0.48	0.49	0.50	0.50	0.49	0.50	0.49	0.49	0.48	0.48
Y2-1	0.46	0.46	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44
Y2-2	0.53	0.54	0.55	0.54	0.54	0.54	0.53	0.53	0.52	0.52
Y2-3	0.55	0.55	0.57	0.57	0.56	0.56	0.56	0.56	0.55	0.54
Y2-4	0.56	0.57	0.59	0.58	0.58	0.58	0.58	0.58	0.57	0.57
Y2-5	0.58	0.59	0.60	0.59	0.58	0.59	0.58	0.58	0.57	0.57
Y2-6	0.47	0.47	0.49	0.48	0.48	0.48	0.48	0.48	0.47	0.46
Y2-7	0.48	0.48	0.50	0.50	0.49	0.50	0.49	0.49	0.48	0.48

Appendix L (cont.)

L[m]	24.00	24.60	25.20	25.80	26.40	27.00	27.60	28.20	28.80	29.40
A1-1	0.42	0.42	0.42	0.42	0.41	0.41	0.41	0.40	0.40	0.40
A1-2	0.50	0.51	0.50	0.50	0.49	0.49	0.49	0.48	0.47	0.47
A1-3	0.53	0.53	0.53	0.53	0.52	0.51	0.51	0.51	0.50	0.50
A1-4	0.55	0.56	0.55	0.55	0.54	0.54	0.54	0.53	0.53	0.53
A1-5	0.56	0.56	0.56	0.56	0.55	0.54	0.54	0.54	0.53	0.53
A1-6	0.44	0.45	0.44	0.44	0.43	0.43	0.43	0.43	0.42	0.42
A1-7	0.47	0.47	0.46	0.46	0.45	0.45	0.45	0.45	0.44	0.44
A2-1	0.42	0.42	0.42	0.42	0.41	0.41	0.41	0.40	0.40	0.40
A2-2	0.50	0.51	0.50	0.51	0.49	0.49	0.49	0.48	0.48	0.47
A2-3	0.53	0.53	0.53	0.53	0.52	0.51	0.51	0.51	0.50	0.50
A2-4	0.55	0.56	0.55	0.56	0.54	0.54	0.54	0.53	0.53	0.53
A2-5	0.56	0.56	0.56	0.56	0.55	0.54	0.54	0.54	0.53	0.53
A2-6	0.44	0.45	0.44	0.44	0.43	0.43	0.43	0.43	0.42	0.42
A2-7	0.47	0.47	0.46	0.47	0.45	0.45	0.45	0.45	0.44	0.44
A4-1	0.42	0.42	0.42	0.42	0.41	0.41	0.41	0.40	0.40	0.40
A4-2	0.50	0.51	0.50	0.50	0.50	0.49	0.49	0.48	0.47	0.48
A4-3	0.52	0.53	0.53	0.53	0.52	0.51	0.51	0.51	0.50	0.51
A4-4	0.55	0.56	0.55	0.55	0.55	0.54	0.54	0.53	0.53	0.53
A4-5	0.55	0.56	0.56	0.56	0.55	0.54	0.54	0.54	0.53	0.53
A4-6	0.44	0.45	0.44	0.44	0.44	0.43	0.43	0.43	0.42	0.43
A4-7	0.46	0.47	0.47	0.46	0.46	0.45	0.45	0.45	0.44	0.45
B1-2	0.50	0.50	0.50	0.50	0.49	0.49	0.48	0.48	0.47	0.47
B2-2	0.50	0.50	0.50	0.50	0.49	0.49	0.48	0.48	0.47	0.47
C1-2	0.50	0.49	0.49	0.49	0.49	0.47	0.47	0.47	0.46	0.47
C2-2	0.49	0.49	0.49	0.49	0.49	0.48	0.47	0.47	0.46	0.47
D1-2	0.48	0.47	0.47	0.48	0.48	0.48	0.47	0.47	0.46	0.46
D2-2	0.48	0.47	0.47	0.48	0.48	0.48	0.47	0.47	0.46	0.46
X1-1	0.48	0.48	0.47	0.47	0.47	0.46	0.46	0.45	0.45	0.45
X1-2	0.57	0.56	0.56	0.56	0.56	0.55	0.54	0.53	0.53	0.53
X1-3	0.59	0.59	0.59	0.58	0.58	0.58	0.57	0.56	0.56	0.56
X1-4	0.63	0.62	0.62	0.62	0.62	0.61	0.60	0.59	0.59	0.59
X1-5	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.59	0.59	0.59
X1-6	0.50	0.50	0.49	0.49	0.49	0.48	0.48	0.47	0.47	0.47
X1-7	0.53	0.52	0.52	0.52	0.52	0.51	0.50	0.49	0.49	0.49
X2-1	0.48	0.48	0.47	0.47	0.47	0.46	0.46	0.45	0.45	0.45
X2-2	0.57	0.57	0.56	0.56	0.56	0.55	0.54	0.54	0.54	0.53
X2-3	0.59	0.59	0.59	0.58	0.58	0.57	0.57	0.56	0.56	0.56
X2-4	0.63	0.62	0.62	0.62	0.62	0.60	0.60	0.59	0.59	0.59
X2-5	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59
X2-6	0.50	0.50	0.49	0.49	0.49	0.48	0.48	0.47	0.47	0.47
X2-7	0.53	0.52	0.52	0.52	0.52	0.50	0.50	0.50	0.50	0.49
Y1-1	0.44	0.44	0.44	0.43	0.43	0.43	0.43	0.43	0.42	0.42
Y1-2	0.51	0.52	0.51	0.51	0.51	0.51	0.51	0.50	0.50	0.50
Y1-3	0.54	0.54	0.54	0.54	0.53	0.53	0.53	0.53	0.53	0.53
Y1-4	0.57	0.57	0.57	0.56	0.56	0.56	0.56	0.55	0.55	0.55
Y1-5	0.57	0.57	0.57	0.56	0.56	0.56	0.56	0.56	0.55	0.56
Y1-6	0.46	0.46	0.46	0.46	0.45	0.45	0.45	0.45	0.45	0.44
Y1-7	0.49	0.49	0.48	0.48	0.48	0.48	0.48	0.47	0.47	0.47
Y2-1	0.45	0.44	0.43	0.42	0.43	0.43	0.43	0.43	0.42	0.42
Y2-2	0.53	0.51	0.51	0.50	0.51	0.51	0.51	0.50	0.50	0.50
Y2-3	0.55	0.54	0.54	0.53	0.53	0.53	0.53	0.53	0.53	0.53
Y2-4	0.58	0.57	0.57	0.56	0.56	0.56	0.56	0.55	0.55	0.55
Y2-5	0.58	0.57	0.56	0.55	0.56	0.56	0.56	0.56	0.56	0.56
Y2-6	0.47	0.46	0.46	0.45	0.45	0.45	0.45	0.45	0.45	0.44
Y2-7	0.50	0.49	0.48	0.48	0.48	0.48	0.48	0.47	0.47	0.47

Appendix L (cont.)

L[m]	30.00	30.60	31.20	31.80	32.40	33.00	33.60	34.20	34.80	35.40
A1-1	0.39	0.38	0.37	0.36	0.36	0.36	0.36	0.36	0.36	0.36
A1-2	0.46	0.45	0.44	0.43	0.43	0.43	0.43	0.43	0.43	0.43
A1-3	0.49	0.49	0.47	0.46	0.46	0.46	0.46	0.46	0.46	0.46
A1-4	0.52	0.51	0.50	0.49	0.49	0.49	0.49	0.49	0.49	0.49
A1-5	0.51	0.50	0.49	0.48	0.48	0.48	0.48	0.48	0.48	0.48
A1-6	0.41	0.41	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
A1-7	0.43	0.43	0.42	0.41	0.41	0.41	0.41	0.41	0.41	0.41
A2-1	0.39	0.39	0.37	0.36	0.36	0.36	0.36	0.36	0.36	0.36
A2-2	0.47	0.46	0.44	0.43	0.43	0.43	0.43	0.43	0.43	0.43
A2-3	0.50	0.49	0.47	0.46	0.46	0.46	0.46	0.46	0.46	0.46
A2-4	0.52	0.51	0.50	0.49	0.49	0.49	0.49	0.49	0.49	0.49
A2-5	0.52	0.51	0.49	0.48	0.48	0.48	0.48	0.47	0.48	0.48
A2-6	0.42	0.41	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
A2-7	0.44	0.43	0.42	0.41	0.41	0.41	0.41	0.41	0.41	0.41
A4-1	0.39	0.38	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
A4-2	0.46	0.45	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
A4-3	0.50	0.48	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
A4-4	0.52	0.51	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
A4-5	0.51	0.50	0.48	0.48	0.48	0.48	0.48	0.47	0.48	0.48
A4-6	0.41	0.40	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
A4-7	0.44	0.43	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
B1-2	0.47	0.45	0.44	0.43	0.43	0.43	0.43	0.43	0.43	0.43
B2-2	0.47	0.45	0.44	0.43	0.43	0.43	0.43	0.43	0.43	0.43
C1-2	0.46	0.45	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
C2-2	0.46	0.45	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
D1-2	0.45	0.44	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
D2-2	0.45	0.44	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
X1-1	0.44	0.43	0.43	0.42	0.42	0.42	0.42	0.41	0.41	0.40
X1-2	0.52	0.51	0.51	0.50	0.50	0.50	0.50	0.49	0.49	0.48
X1-3	0.55	0.54	0.54	0.54	0.54	0.53	0.53	0.53	0.53	0.51
X1-4	0.58	0.57	0.57	0.57	0.57	0.56	0.56	0.56	0.56	0.54
X1-5	0.59	0.57	0.57	0.56	0.56	0.55	0.55	0.54	0.54	0.53
X1-6	0.46	0.45	0.45	0.45	0.45	0.44	0.44	0.44	0.44	0.43
X1-7	0.49	0.48	0.48	0.47	0.47	0.47	0.47	0.47	0.47	0.45
X2-1	0.44	0.43	0.43	0.42	0.42	0.42	0.42	0.41	0.41	0.40
X2-2	0.52	0.52	0.52	0.51	0.50	0.50	0.50	0.49	0.48	0.48
X2-3	0.55	0.54	0.54	0.54	0.54	0.53	0.53	0.53	0.52	0.52
X2-4	0.58	0.57	0.57	0.57	0.57	0.56	0.56	0.56	0.55	0.55
X2-5	0.59	0.58	0.58	0.57	0.56	0.55	0.55	0.55	0.54	0.53
X2-6	0.46	0.45	0.45	0.45	0.45	0.44	0.44	0.44	0.44	0.43
X2-7	0.49	0.48	0.48	0.47	0.47	0.47	0.47	0.47	0.46	0.46
Y1-1	0.42	0.42	0.42	0.43	0.42	0.42	0.42	0.41	0.41	0.41
Y1-2	0.50	0.50	0.50	0.51	0.50	0.50	0.50	0.50	0.50	0.49
Y1-3	0.53	0.53	0.52	0.54	0.53	0.53	0.53	0.52	0.52	0.52
Y1-4	0.55	0.55	0.55	0.56	0.55	0.56	0.55	0.55	0.55	0.55
Y1-5	0.56	0.56	0.56	0.57	0.56	0.56	0.56	0.55	0.55	0.55
Y1-6	0.44	0.44	0.44	0.45	0.44	0.44	0.44	0.44	0.44	0.43
Y1-7	0.47	0.47	0.46	0.47	0.46	0.47	0.46	0.46	0.46	0.46
Y2-1	0.42	0.42	0.42	0.43	0.42	0.42	0.42	0.41	0.42	0.41
Y2-2	0.50	0.50	0.50	0.51	0.50	0.50	0.50	0.50	0.50	0.49
Y2-3	0.53	0.53	0.52	0.54	0.53	0.53	0.53	0.52	0.53	0.52
Y2-4	0.55	0.55	0.55	0.56	0.56	0.56	0.55	0.55	0.55	0.55
Y2-5	0.56	0.56	0.56	0.57	0.56	0.56	0.56	0.55	0.56	0.55
Y2-6	0.44	0.44	0.44	0.45	0.44	0.44	0.44	0.44	0.44	0.43
Y2-7	0.47	0.46	0.46	0.47	0.47	0.47	0.46	0.46	0.46	0.46

Appendix M – *FAC2* of NH_3. *L* ranging 0~35.4 m and different condition scenarios

L[m]	0.00	0.60	1.20	1.80	2.40	3.00	3.60	4.20	4.80	5.40
A1-1	0.39	0.49	0.53	0.51	0.50	0.50	0.52	0.53	0.54	0.54
A1-2	0.45	0.57	0.61	0.59	0.58	0.58	0.60	0.62	0.63	0.63
A1-3	0.43	0.57	0.62	0.59	0.58	0.58	0.61	0.63	0.63	0.63
A1-4	0.44	0.60	0.64	0.62	0.61	0.60	0.62	0.63	0.63	0.63
A1-5	0.50	0.64	0.69	0.66	0.65	0.65	0.68	0.70	0.71	0.71
A1-6	0.36	0.49	0.52	0.50	0.49	0.49	0.51	0.53	0.54	0.54
A1-7	0.37	0.50	0.54	0.52	0.51	0.50	0.52	0.52	0.53	0.52
A2-1	0.38	0.49	0.53	0.52	0.51	0.52	0.52	0.53	0.53	0.54
A2-2	0.44	0.57	0.62	0.60	0.59	0.60	0.60	0.62	0.62	0.62
A2-3	0.42	0.57	0.63	0.61	0.59	0.61	0.61	0.63	0.63	0.63
A2-4	0.43	0.60	0.65	0.63	0.62	0.63	0.62	0.63	0.63	0.63
A2-5	0.49	0.64	0.70	0.68	0.66	0.68	0.68	0.70	0.70	0.70
A2-6	0.36	0.49	0.53	0.51	0.50	0.51	0.51	0.53	0.53	0.54
A2-7	0.36	0.50	0.55	0.53	0.52	0.52	0.52	0.53	0.53	0.52
A4-1	0.41	0.50	0.53	0.51	0.50	0.50	0.51	0.53	0.54	0.55
A4-2	0.48	0.58	0.61	0.59	0.58	0.58	0.59	0.62	0.63	0.63
A4-3	0.46	0.58	0.62	0.60	0.58	0.58	0.60	0.63	0.63	0.64
A4-4	0.48	0.61	0.64	0.63	0.61	0.60	0.61	0.63	0.63	0.63
A4-5	0.54	0.65	0.69	0.67	0.65	0.65	0.67	0.70	0.71	0.71
A4-6	0.39	0.49	0.52	0.51	0.49	0.49	0.51	0.53	0.54	0.55
A4-7	0.40	0.51	0.54	0.52	0.51	0.50	0.51	0.52	0.53	0.53
B1-2	0.52	0.59	0.61	0.59	0.57	0.59	0.59	0.59	0.63	0.63
B2-2	0.52	0.59	0.61	0.59	0.57	0.59	0.59	0.59	0.63	0.63
C1-2	0.55	0.61	0.59	0.58	0.59	0.60	0.60	0.59	0.61	0.59
C2-2	0.54	0.61	0.59	0.59	0.59	0.60	0.60	0.59	0.59	0.59
D1-2	0.57	0.57	0.58	0.58	0.59	0.59	0.58	0.59	0.59	0.59
D2-2	0.57	0.57	0.58	0.58	0.59	0.59	0.58	0.59	0.59	0.59
X1-1	0.38	0.53	0.56	0.57	0.57	0.57	0.56	0.55	0.55	0.55
X1-2	0.45	0.63	0.67	0.68	0.68	0.68	0.67	0.66	0.66	0.65
X1-3	0.42	0.62	0.67	0.68	0.68	0.68	0.67	0.65	0.65	0.64
X1-4	0.43	0.64	0.70	0.71	0.71	0.71	0.68	0.66	0.66	0.65
X1-5	0.51	0.71	0.76	0.77	0.77	0.77	0.76	0.74	0.74	0.73
X1-6	0.35	0.51	0.56	0.56	0.56	0.56	0.56	0.54	0.54	0.54
X1-7	0.36	0.54	0.58	0.59	0.59	0.59	0.57	0.55	0.55	0.55
X2-1	0.37	0.51	0.56	0.56	0.57	0.56	0.57	0.56	0.54	0.55
X2-2	0.45	0.60	0.66	0.67	0.68	0.67	0.68	0.66	0.65	0.65
X2-3	0.41	0.59	0.66	0.67	0.68	0.67	0.68	0.66	0.64	0.64
X2-4	0.42	0.62	0.69	0.70	0.71	0.70	0.69	0.67	0.65	0.65
X2-5	0.50	0.68	0.75	0.76	0.77	0.76	0.77	0.75	0.73	0.73
X2-6	0.34	0.49	0.55	0.56	0.56	0.56	0.56	0.55	0.54	0.54
X2-7	0.35	0.52	0.58	0.58	0.59	0.58	0.58	0.56	0.55	0.55
Y1-1	0.36	0.43	0.46	0.46	0.46	0.46	0.48	0.48	0.48	0.49
Y1-2	0.43	0.51	0.55	0.55	0.55	0.55	0.57	0.57	0.58	0.58
Y1-3	0.49	0.58	0.63	0.63	0.63	0.63	0.65	0.65	0.66	0.66
Y1-4	0.53	0.63	0.67	0.67	0.67	0.67	0.69	0.68	0.69	0.68
Y1-5	0.48	0.57	0.62	0.62	0.62	0.62	0.64	0.64	0.65	0.65
Y1-6	0.41	0.49	0.52	0.52	0.52	0.52	0.54	0.54	0.55	0.56
Y1-7	0.44	0.52	0.56	0.56	0.56	0.56	0.58	0.57	0.58	0.57
Y2-1	0.36	0.42	0.47	0.45	0.46	0.46	0.47	0.48	0.48	0.49
Y2-2	0.43	0.50	0.56	0.54	0.55	0.55	0.56	0.57	0.57	0.58
Y2-3	0.49	0.57	0.64	0.62	0.63	0.63	0.64	0.65	0.65	0.66
Y2-4	0.53	0.62	0.69	0.66	0.67	0.68	0.69	0.69	0.68	0.68
Y2-5	0.48	0.56	0.63	0.61	0.62	0.63	0.63	0.64	0.64	0.65
Y2-6	0.41	0.48	0.54	0.51	0.52	0.53	0.54	0.54	0.54	0.56
Y2-7	0.44	0.52	0.58	0.55	0.56	0.57	0.58	0.58	0.57	0.57

Appendix M (cont.)

L[m]	6.00	6.60	7.20	7.80	8.40	9.00	9.60	10.20	10.80	11.40
A1-1	0.53	0.53	0.52	0.53	0.53	0.52	0.52	0.50	0.49	0.49
A1-2	0.60	0.61	0.60	0.61	0.62	0.61	0.61	0.59	0.59	0.59
A1-3	0.61	0.61	0.60	0.61	0.61	0.60	0.59	0.58	0.58	0.58
A1-4	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.59	0.59	0.59
A1-5	0.68	0.69	0.68	0.68	0.69	0.68	0.68	0.66	0.66	0.66
A1-6	0.52	0.52	0.51	0.51	0.51	0.51	0.50	0.49	0.49	0.49
A1-7	0.51	0.51	0.51	0.51	0.51	0.50	0.50	0.49	0.49	0.49
A2-1	0.53	0.53	0.52	0.52	0.52	0.51	0.50	0.49	0.48	0.48
A2-2	0.60	0.61	0.60	0.60	0.60	0.60	0.59	0.58	0.58	0.58
A2-3	0.61	0.61	0.60	0.60	0.60	0.59	0.57	0.57	0.57	0.57
A2-4	0.61	0.61	0.60	0.60	0.60	0.59	0.58	0.58	0.58	0.58
A2-5	0.68	0.69	0.68	0.67	0.67	0.67	0.65	0.64	0.64	0.64
A2-6	0.52	0.52	0.51	0.51	0.51	0.50	0.49	0.48	0.48	0.48
A2-7	0.51	0.51	0.50	0.50	0.50	0.49	0.48	0.48	0.48	0.48
A4-1	0.53	0.53	0.53	0.53	0.53	0.53	0.51	0.50	0.49	0.49
A4-2	0.61	0.61	0.61	0.61	0.62	0.62	0.60	0.59	0.59	0.59
A4-3	0.62	0.61	0.61	0.61	0.61	0.61	0.59	0.58	0.58	0.58
A4-4	0.62	0.61	0.61	0.61	0.61	0.61	0.60	0.59	0.59	0.59
A4-5	0.69	0.69	0.68	0.68	0.69	0.69	0.67	0.66	0.66	0.66
A4-6	0.53	0.52	0.51	0.51	0.51	0.51	0.50	0.49	0.49	0.49
A4-7	0.52	0.51	0.51	0.51	0.51	0.51	0.50	0.49	0.49	0.49
B1-2	0.62	0.62	0.61	0.61	0.62	0.61	0.61	0.60	0.59	0.59
B2-2	0.62	0.62	0.61	0.61	0.62	0.61	0.61	0.60	0.59	0.59
C1-2	0.62	0.62	0.62	0.59	0.59	0.59	0.59	0.58	0.59	0.56
C2-2	0.59	0.60	0.61	0.60	0.59	0.59	0.59	0.58	0.58	0.56
D1-2	0.58	0.59	0.58	0.57	0.54	0.53	0.55	0.53	0.53	0.53
D2-2	0.58	0.59	0.58	0.57	0.54	0.53	0.55	0.53	0.53	0.53
X1-1	0.56	0.57	0.56	0.56	0.56	0.54	0.54	0.53	0.53	0.54
X1-2	0.65	0.66	0.66	0.66	0.66	0.64	0.63	0.63	0.63	0.63
X1-3	0.63	0.65	0.64	0.65	0.65	0.63	0.62	0.62	0.61	0.62
X1-4	0.65	0.65	0.65	0.65	0.65	0.63	0.62	0.62	0.62	0.63
X1-5	0.73	0.75	0.74	0.74	0.74	0.71	0.71	0.71	0.70	0.71
X1-6	0.54	0.56	0.55	0.55	0.55	0.53	0.52	0.51	0.51	0.51
X1-7	0.55	0.55	0.55	0.55	0.55	0.52	0.52	0.52	0.52	0.52
X2-1	0.56	0.57	0.56	0.57	0.56	0.54	0.54	0.53	0.53	0.54
X2-2	0.65	0.66	0.65	0.66	0.66	0.63	0.63	0.63	0.63	0.63
X2-3	0.63	0.65	0.63	0.65	0.64	0.62	0.62	0.62	0.61	0.62
X2-4	0.65	0.65	0.65	0.65	0.64	0.62	0.62	0.62	0.62	0.63
X2-5	0.73	0.75	0.73	0.74	0.73	0.71	0.71	0.71	0.70	0.71
X2-6	0.54	0.56	0.54	0.56	0.54	0.52	0.52	0.51	0.51	0.51
X2-7	0.55	0.55	0.55	0.55	0.54	0.52	0.52	0.52	0.52	0.52
Y1-1	0.49	0.49	0.49	0.49	0.49	0.50	0.52	0.52	0.52	0.49
Y1-2	0.58	0.57	0.57	0.59	0.59	0.59	0.61	0.61	0.61	0.59
Y1-3	0.66	0.65	0.65	0.67	0.66	0.66	0.68	0.68	0.68	0.66
Y1-4	0.68	0.68	0.66	0.66	0.66	0.66	0.68	0.68	0.68	0.67
Y1-5	0.65	0.64	0.64	0.65	0.65	0.65	0.68	0.68	0.68	0.65
Y1-6	0.56	0.56	0.56	0.56	0.56	0.56	0.57	0.56	0.56	0.55
Y1-7	0.57	0.57	0.55	0.55	0.55	0.55	0.57	0.57	0.57	0.56
Y2-1	0.50	0.48	0.49	0.50	0.50	0.51	0.51	0.51	0.51	0.49
Y2-2	0.59	0.56	0.57	0.59	0.59	0.59	0.60	0.60	0.60	0.58
Y2-3	0.67	0.64	0.65	0.67	0.67	0.67	0.67	0.67	0.67	0.65
Y2-4	0.69	0.67	0.67	0.66	0.67	0.67	0.67	0.67	0.67	0.66
Y2-5	0.66	0.63	0.64	0.65	0.66	0.66	0.67	0.67	0.67	0.64
Y2-6	0.57	0.55	0.56	0.57	0.56	0.56	0.56	0.56	0.56	0.54
Y2-7	0.58	0.56	0.56	0.55	0.56	0.56	0.56	0.56	0.56	0.55

Appendix M (cont.)

L[m]	12.00	12.60	13.20	13.80	14.40	15.00	15.60	16.20	16.80	17.40
A1-1	0.49	0.49	0.46	0.47	0.46	0.46	0.45	0.44	0.43	0.43
A1-2	0.59	0.59	0.55	0.56	0.55	0.55	0.54	0.53	0.52	0.52
A1-3	0.57	0.58	0.54	0.55	0.55	0.54	0.54	0.54	0.54	0.54
A1-4	0.59	0.60	0.58	0.59	0.59	0.58	0.58	0.58	0.57	0.57
A1-5	0.65	0.65	0.61	0.62	0.61	0.60	0.59	0.57	0.55	0.55
A1-6	0.48	0.49	0.46	0.46	0.46	0.46	0.46	0.46	0.45	0.45
A1-7	0.49	0.50	0.48	0.49	0.49	0.48	0.48	0.48	0.48	0.48
A2-1	0.49	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.43
A2-2	0.59	0.58	0.56	0.56	0.55	0.55	0.54	0.54	0.53	0.52
A2-3	0.57	0.56	0.55	0.55	0.55	0.54	0.54	0.54	0.54	0.54
A2-4	0.59	0.59	0.58	0.59	0.59	0.58	0.58	0.58	0.58	0.57
A2-5	0.65	0.63	0.62	0.62	0.61	0.60	0.59	0.58	0.57	0.55
A2-6	0.48	0.47	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.45
A2-7	0.49	0.49	0.48	0.49	0.49	0.48	0.48	0.48	0.48	0.48
A4-1	0.49	0.48	0.47	0.48	0.46	0.46	0.45	0.44	0.43	0.43
A4-2	0.59	0.58	0.56	0.57	0.55	0.55	0.54	0.53	0.52	0.52
A4-3	0.57	0.57	0.55	0.56	0.55	0.55	0.54	0.54	0.54	0.54
A4-4	0.59	0.60	0.59	0.60	0.59	0.59	0.58	0.58	0.57	0.57
A4-5	0.65	0.63	0.62	0.63	0.61	0.61	0.59	0.57	0.55	0.55
A4-6	0.48	0.48	0.46	0.47	0.46	0.46	0.46	0.46	0.45	0.45
A4-7	0.49	0.50	0.49	0.50	0.49	0.49	0.48	0.48	0.48	0.48
B1-2	0.59	0.57	0.57	0.56	0.56	0.55	0.53	0.52	0.52	0.52
B2-2	0.59	0.57	0.57	0.56	0.56	0.55	0.53	0.52	0.52	0.52
C1-2	0.55	0.54	0.55	0.55	0.54	0.53	0.53	0.52	0.52	0.52
C2-2	0.55	0.54	0.55	0.54	0.54	0.52	0.53	0.52	0.52	0.52
D1-2	0.52	0.53	0.51	0.52	0.52	0.51	0.52	0.53	0.50	0.50
D2-2	0.52	0.53	0.51	0.52	0.52	0.51	0.52	0.53	0.50	0.50
X1-1	0.53	0.53	0.53	0.54	0.51	0.51	0.48	0.47	0.46	0.45
X1-2	0.63	0.63	0.62	0.63	0.60	0.59	0.56	0.55	0.54	0.53
X1-3	0.60	0.60	0.59	0.60	0.58	0.57	0.55	0.54	0.54	0.53
X1-4	0.63	0.63	0.63	0.63	0.62	0.61	0.59	0.58	0.57	0.56
X1-5	0.70	0.69	0.68	0.69	0.66	0.65	0.62	0.60	0.58	0.57
X1-6	0.50	0.50	0.49	0.50	0.49	0.48	0.46	0.46	0.45	0.44
X1-7	0.52	0.52	0.52	0.53	0.52	0.51	0.49	0.48	0.48	0.47
X2-1	0.54	0.52	0.53	0.53	0.51	0.51	0.49	0.47	0.46	0.45
X2-2	0.63	0.61	0.62	0.62	0.60	0.59	0.57	0.55	0.55	0.53
X2-3	0.61	0.59	0.59	0.59	0.58	0.57	0.55	0.54	0.54	0.53
X2-4	0.63	0.62	0.62	0.63	0.62	0.61	0.59	0.57	0.57	0.56
X2-5	0.71	0.68	0.68	0.68	0.66	0.65	0.63	0.59	0.59	0.57
X2-6	0.51	0.49	0.49	0.49	0.49	0.48	0.46	0.45	0.45	0.44
X2-7	0.52	0.52	0.52	0.52	0.52	0.51	0.49	0.48	0.48	0.47
Y1-1	0.50	0.49	0.48	0.49	0.49	0.48	0.47	0.48	0.47	0.46
Y1-2	0.59	0.58	0.57	0.57	0.57	0.56	0.55	0.56	0.56	0.55
Y1-3	0.65	0.63	0.62	0.59	0.59	0.58	0.57	0.58	0.57	0.56
Y1-4	0.66	0.64	0.63	0.63	0.63	0.62	0.61	0.62	0.61	0.60
Y1-5	0.66	0.64	0.63	0.63	0.63	0.62	0.61	0.62	0.61	0.60
Y1-6	0.54	0.53	0.51	0.49	0.49	0.49	0.48	0.49	0.48	0.47
Y1-7	0.55	0.54	0.53	0.52	0.52	0.52	0.51	0.52	0.51	0.50
Y2-1	0.49	0.48	0.49	0.48	0.48	0.48	0.47	0.48	0.46	0.46
Y2-2	0.58	0.56	0.57	0.56	0.56	0.56	0.55	0.56	0.55	0.55
Y2-3	0.64	0.62	0.61	0.59	0.58	0.58	0.57	0.58	0.56	0.55
Y2-4	0.65	0.63	0.63	0.62	0.62	0.62	0.61	0.62	0.60	0.59
Y2-5	0.64	0.63	0.63	0.62	0.62	0.62	0.61	0.62	0.60	0.59
Y2-6	0.54	0.51	0.51	0.49	0.49	0.49	0.48	0.49	0.47	0.46
Y2-7	0.55	0.52	0.52	0.52	0.52	0.52	0.51	0.52	0.50	0.49

Appendix M (cont.)

L[m]	18.00	18.60	19.20	19.80	20.40	21.00	21.60	22.20	22.80	23.40
A1-1	0.42	0.43	0.43	0.43	0.43	0.41	0.40	0.40	0.39	0.38
A1-2	0.50	0.51	0.51	0.51	0.51	0.49	0.48	0.48	0.46	0.45
A1-3	0.52	0.52	0.52	0.52	0.52	0.51	0.50	0.50	0.50	0.49
A1-4	0.55	0.55	0.55	0.55	0.55	0.54	0.53	0.53	0.53	0.52
A1-5	0.54	0.54	0.54	0.54	0.54	0.53	0.52	0.52	0.51	0.49
A1-6	0.44	0.44	0.44	0.44	0.44	0.43	0.42	0.42	0.42	0.41
A1-7	0.46	0.46	0.46	0.46	0.46	0.45	0.45	0.45	0.45	0.44
A2-1	0.42	0.42	0.43	0.43	0.42	0.41	0.40	0.40	0.39	0.38
A2-2	0.50	0.50	0.51	0.51	0.50	0.49	0.48	0.48	0.46	0.45
A2-3	0.52	0.52	0.52	0.52	0.51	0.50	0.50	0.50	0.50	0.49
A2-4	0.55	0.55	0.55	0.55	0.54	0.53	0.53	0.53	0.53	0.52
A2-5	0.54	0.54	0.54	0.54	0.54	0.53	0.52	0.52	0.51	0.49
A2-6	0.44	0.44	0.44	0.44	0.43	0.42	0.42	0.42	0.42	0.41
A2-7	0.46	0.46	0.46	0.46	0.45	0.45	0.45	0.45	0.45	0.44
A4-1	0.42	0.43	0.43	0.43	0.42	0.41	0.40	0.39	0.39	0.38
A4-2	0.50	0.51	0.51	0.51	0.50	0.48	0.48	0.47	0.46	0.45
A4-3	0.52	0.52	0.52	0.52	0.52	0.50	0.50	0.50	0.50	0.49
A4-4	0.55	0.55	0.55	0.55	0.55	0.53	0.53	0.53	0.53	0.52
A4-5	0.54	0.54	0.54	0.54	0.54	0.52	0.52	0.52	0.51	0.49
A4-6	0.44	0.44	0.44	0.44	0.44	0.42	0.42	0.42	0.42	0.41
A4-7	0.46	0.46	0.46	0.46	0.46	0.45	0.45	0.45	0.45	0.44
B1-2	0.52	0.51	0.51	0.51	0.48	0.48	0.47	0.46	0.45	0.45
B2-2	0.52	0.51	0.51	0.51	0.48	0.48	0.47	0.46	0.45	0.45
C1-2	0.52	0.49	0.48	0.48	0.48	0.45	0.45	0.45	0.45	0.45
C2-2	0.52	0.50	0.48	0.48	0.47	0.45	0.45	0.45	0.45	0.45
D1-2	0.49	0.48	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.44
D2-2	0.49	0.48	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.44
X1-1	0.45	0.44	0.44	0.44	0.43	0.43	0.41	0.39	0.39	0.39
X1-2	0.53	0.52	0.52	0.52	0.51	0.51	0.48	0.46	0.45	0.45
X1-3	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.50	0.50	0.50
X1-4	0.56	0.56	0.55	0.55	0.55	0.55	0.55	0.53	0.53	0.53
X1-5	0.57	0.56	0.55	0.55	0.54	0.54	0.53	0.50	0.50	0.50
X1-6	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.42	0.42	0.42
X1-7	0.47	0.47	0.46	0.46	0.46	0.46	0.46	0.45	0.45	0.45
X2-1	0.45	0.44	0.44	0.44	0.43	0.43	0.42	0.39	0.39	0.38
X2-2	0.53	0.52	0.52	0.52	0.51	0.51	0.49	0.46	0.45	0.45
X2-3	0.53	0.53	0.53	0.52	0.52	0.52	0.52	0.50	0.50	0.49
X2-4	0.56	0.56	0.56	0.55	0.55	0.55	0.55	0.53	0.53	0.52
X2-5	0.57	0.56	0.56	0.55	0.54	0.54	0.54	0.50	0.50	0.49
X2-6	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.42	0.42	0.41
X2-7	0.47	0.47	0.47	0.46	0.46	0.46	0.46	0.45	0.45	0.44
Y1-1	0.44	0.46	0.46	0.44	0.44	0.45	0.43	0.43	0.41	0.41
Y1-2	0.53	0.55	0.55	0.53	0.52	0.54	0.52	0.52	0.49	0.49
Y1-3	0.56	0.57	0.57	0.55	0.54	0.56	0.54	0.54	0.54	0.54
Y1-4	0.60	0.61	0.61	0.59	0.58	0.60	0.58	0.58	0.57	0.57
Y1-5	0.57	0.60	0.59	0.57	0.56	0.58	0.56	0.56	0.54	0.54
Y1-6	0.47	0.48	0.48	0.46	0.46	0.47	0.46	0.46	0.45	0.45
Y1-7	0.50	0.51	0.51	0.49	0.48	0.50	0.48	0.48	0.48	0.48
Y2-1	0.45	0.46	0.46	0.44	0.44	0.44	0.43	0.43	0.41	0.42
Y2-2	0.54	0.55	0.55	0.53	0.52	0.53	0.52	0.52	0.49	0.50
Y2-3	0.56	0.56	0.57	0.55	0.54	0.55	0.54	0.54	0.54	0.54
Y2-4	0.60	0.60	0.61	0.59	0.58	0.59	0.58	0.58	0.57	0.57
Y2-5	0.58	0.59	0.60	0.57	0.56	0.57	0.56	0.56	0.54	0.55
Y2-6	0.47	0.47	0.48	0.46	0.46	0.46	0.46	0.46	0.45	0.45
Y2-7	0.50	0.50	0.51	0.49	0.48	0.49	0.48	0.48	0.48	0.48

Appendix M (cont.)

L[m]	24.00	24.60	25.20	25.80	26.40	27.00	27.60	28.20	28.80	29.40
A1-1	0.36	0.36	0.36	0.36	0.35	0.34	0.34	0.34	0.33	0.33
A1-2	0.43	0.43	0.43	0.43	0.42	0.41	0.41	0.41	0.39	0.39
A1-3	0.47	0.47	0.47	0.47	0.46	0.46	0.46	0.45	0.44	0.44
A1-4	0.51	0.51	0.51	0.51	0.50	0.49	0.49	0.48	0.47	0.47
A1-5	0.48	0.48	0.48	0.48	0.47	0.46	0.46	0.46	0.44	0.44
A1-6	0.40	0.40	0.39	0.39	0.39	0.38	0.38	0.37	0.36	0.36
A1-7	0.43	0.43	0.42	0.42	0.42	0.41	0.41	0.40	0.39	0.39
A2-1	0.36	0.36	0.36	0.36	0.35	0.34	0.34	0.34	0.33	0.33
A2-2	0.43	0.43	0.43	0.43	0.42	0.41	0.41	0.41	0.40	0.39
A2-3	0.47	0.47	0.47	0.47	0.46	0.46	0.46	0.45	0.44	0.44
A2-4	0.51	0.51	0.51	0.51	0.50	0.49	0.49	0.48	0.47	0.47
A2-5	0.48	0.48	0.48	0.48	0.47	0.46	0.46	0.46	0.45	0.44
A2-6	0.40	0.40	0.39	0.39	0.39	0.38	0.38	0.37	0.36	0.36
A2-7	0.43	0.43	0.42	0.42	0.42	0.41	0.41	0.40	0.39	0.39
A4-1	0.36	0.36	0.36	0.36	0.36	0.34	0.34	0.34	0.33	0.33
A4-2	0.43	0.43	0.43	0.43	0.43	0.41	0.41	0.41	0.39	0.39
A4-3	0.47	0.47	0.47	0.47	0.47	0.46	0.46	0.45	0.44	0.44
A4-4	0.51	0.51	0.51	0.51	0.51	0.49	0.49	0.48	0.47	0.47
A4-5	0.48	0.48	0.48	0.48	0.48	0.46	0.46	0.46	0.44	0.44
A4-6	0.40	0.40	0.40	0.39	0.39	0.38	0.38	0.37	0.36	0.36
A4-7	0.43	0.43	0.43	0.42	0.42	0.41	0.41	0.40	0.39	0.39
B1-2	0.43	0.43	0.43	0.43	0.42	0.42	0.41	0.40	0.39	0.39
B2-2	0.43	0.43	0.43	0.43	0.42	0.42	0.41	0.40	0.39	0.39
C1-2	0.44	0.43	0.41	0.41	0.41	0.41	0.41	0.41	0.39	0.39
C2-2	0.43	0.43	0.43	0.41	0.41	0.41	0.41	0.41	0.39	0.39
D1-2	0.43	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.39	0.39
D2-2	0.43	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.39	0.39
X1-1	0.37	0.37	0.37	0.37	0.37	0.36	0.35	0.35	0.34	0.34
X1-2	0.44	0.44	0.44	0.43	0.43	0.42	0.41	0.41	0.40	0.40
X1-3	0.48	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.44	0.44
X1-4	0.52	0.52	0.52	0.51	0.51	0.50	0.49	0.48	0.47	0.47
X1-5	0.49	0.49	0.49	0.48	0.48	0.47	0.46	0.46	0.45	0.45
X1-6	0.41	0.41	0.41	0.40	0.40	0.39	0.39	0.38	0.37	0.37
X1-7	0.44	0.44	0.44	0.43	0.43	0.42	0.42	0.41	0.40	0.40
X2-1	0.37	0.37	0.37	0.37	0.37	0.35	0.35	0.35	0.34	0.34
X2-2	0.44	0.44	0.44	0.43	0.43	0.41	0.41	0.41	0.40	0.40
X2-3	0.48	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.44	0.44
X2-4	0.52	0.52	0.52	0.51	0.51	0.49	0.49	0.48	0.47	0.47
X2-5	0.49	0.49	0.49	0.48	0.48	0.46	0.46	0.46	0.45	0.45
X2-6	0.41	0.41	0.41	0.40	0.40	0.39	0.39	0.38	0.37	0.37
X2-7	0.44	0.44	0.44	0.43	0.43	0.42	0.42	0.41	0.40	0.40
Y1-1	0.41	0.41	0.40	0.39	0.39	0.39	0.39	0.38	0.38	0.38
Y1-2	0.48	0.48	0.48	0.47	0.46	0.46	0.46	0.45	0.45	0.45
Y1-3	0.53	0.52	0.52	0.52	0.51	0.51	0.51	0.50	0.50	0.49
Y1-4	0.57	0.56	0.56	0.56	0.55	0.55	0.55	0.54	0.54	0.53
Y1-5	0.54	0.54	0.54	0.53	0.52	0.52	0.52	0.51	0.51	0.50
Y1-6	0.44	0.44	0.44	0.44	0.43	0.43	0.43	0.42	0.42	0.41
Y1-7	0.48	0.47	0.47	0.47	0.46	0.46	0.46	0.45	0.45	0.45
Y2-1	0.41	0.40	0.40	0.39	0.39	0.39	0.39	0.38	0.38	0.38
Y2-2	0.49	0.48	0.48	0.46	0.46	0.46	0.46	0.45	0.45	0.45
Y2-3	0.53	0.52	0.52	0.51	0.51	0.51	0.51	0.50	0.50	0.49
Y2-4	0.57	0.56	0.56	0.55	0.55	0.55	0.55	0.54	0.54	0.53
Y2-5	0.55	0.54	0.54	0.52	0.52	0.52	0.52	0.51	0.51	0.50
Y2-6	0.44	0.44	0.44	0.43	0.43	0.43	0.43	0.42	0.42	0.41
Y2-7	0.48	0.47	0.47	0.46	0.46	0.46	0.46	0.45	0.45	0.45

Appendix M (cont.)

L[m]	30.00	30.60	31.20	31.80	32.40	33.00	33.60	34.20	34.80	35.40
A1-1	0.31	0.31	0.31	0.31	0.31	0.30	0.30	0.00	0.00	0.00
A1-2	0.38	0.38	0.38	0.38	0.37	0.36	0.36	0.00	0.00	0.00
A1-3	0.42	0.42	0.42	0.42	0.41	0.41	0.41	0.00	0.00	0.00
A1-4	0.45	0.45	0.45	0.45	0.44	0.44	0.44	0.00	0.00	0.00
A1-5	0.42	0.42	0.42	0.42	0.41	0.40	0.40	0.00	0.00	0.00
A1-6	0.35	0.35	0.35	0.35	0.34	0.34	0.34	0.00	0.00	0.00
A1-7	0.38	0.38	0.38	0.38	0.37	0.37	0.37	0.00	0.00	0.00
A2-1	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.00	0.00	0.00
A2-2	0.38	0.38	0.38	0.38	0.36	0.36	0.36	0.00	0.00	0.00
A2-3	0.42	0.42	0.42	0.42	0.41	0.41	0.41	0.00	0.00	0.00
A2-4	0.45	0.45	0.45	0.45	0.44	0.44	0.44	0.00	0.00	0.00
A2-5	0.42	0.42	0.42	0.42	0.40	0.40	0.40	0.00	0.00	0.00
A2-6	0.35	0.35	0.35	0.35	0.34	0.34	0.34	0.00	0.00	0.00
A2-7	0.38	0.38	0.38	0.38	0.37	0.37	0.37	0.00	0.00	0.00
A4-1	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.00	0.00	0.00
A4-2	0.38	0.38	0.38	0.38	0.36	0.36	0.36	0.00	0.00	0.00
A4-3	0.42	0.42	0.42	0.42	0.41	0.41	0.41	0.00	0.00	0.00
A4-4	0.45	0.45	0.45	0.45	0.44	0.44	0.44	0.00	0.00	0.00
A4-5	0.42	0.42	0.42	0.42	0.40	0.40	0.40	0.00	0.00	0.00
A4-6	0.35	0.35	0.35	0.35	0.34	0.34	0.34	0.00	0.00	0.00
A4-7	0.38	0.38	0.38	0.38	0.37	0.37	0.37	0.00	0.00	0.00
B1-2	0.38	0.38	0.38	0.36	0.36	0.36	0.36	0.00	0.00	0.00
B2-2	0.38	0.38	0.38	0.36	0.36	0.36	0.36	0.00	0.00	0.00
C1-2	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.00	0.00	0.00
C2-2	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.00	0.00	0.00
D1-2	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.00	0.00	0.00
D2-2	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.00	0.00	0.00
X1-1	0.32	0.32	0.31	0.31	0.31	0.31	0.30	0.00	0.00	0.00
X1-2	0.38	0.38	0.37	0.37	0.37	0.37	0.35	0.00	0.00	0.00
X1-3	0.43	0.43	0.42	0.42	0.42	0.42	0.40	0.00	0.00	0.00
X1-4	0.46	0.46	0.45	0.45	0.45	0.45	0.43	0.00	0.00	0.00
X1-5	0.43	0.43	0.41	0.41	0.41	0.41	0.39	0.00	0.00	0.00
X1-6	0.36	0.36	0.35	0.35	0.35	0.35	0.34	0.00	0.00	0.00
X1-7	0.38	0.38	0.38	0.38	0.38	0.38	0.36	0.00	0.00	0.00
X2-1	0.32	0.32	0.31	0.31	0.31	0.30	0.30	0.00	0.00	0.00
X2-2	0.38	0.38	0.37	0.37	0.37	0.36	0.35	0.00	0.00	0.00
X2-3	0.43	0.43	0.42	0.42	0.42	0.41	0.40	0.00	0.00	0.00
X2-4	0.46	0.46	0.45	0.45	0.45	0.44	0.43	0.00	0.00	0.00
X2-5	0.43	0.42	0.41	0.41	0.41	0.40	0.39	0.00	0.00	0.00
X2-6	0.36	0.36	0.35	0.35	0.35	0.34	0.34	0.00	0.00	0.00
X2-7	0.38	0.38	0.38	0.38	0.38	0.37	0.36	0.00	0.00	0.00
Y1-1	0.35	0.34	0.33	0.33	0.33	0.33	0.33	0.00	0.00	0.00
Y1-2	0.42	0.41	0.40	0.39	0.39	0.39	0.39	0.00	0.00	0.00
Y1-3	0.46	0.46	0.45	0.44	0.44	0.44	0.44	0.00	0.00	0.00
Y1-4	0.50	0.49	0.48	0.47	0.47	0.47	0.47	0.00	0.00	0.00
Y1-5	0.47	0.46	0.45	0.44	0.44	0.44	0.44	0.00	0.00	0.00
Y1-6	0.39	0.38	0.37	0.36	0.36	0.36	0.36	0.00	0.00	0.00
Y1-7	0.42	0.41	0.40	0.39	0.39	0.39	0.39	0.00	0.00	0.00
Y2-1	0.35	0.34	0.33	0.33	0.33	0.33	0.33	0.00	0.00	0.00
Y2-2	0.42	0.41	0.40	0.39	0.39	0.39	0.39	0.00	0.00	0.00
Y2-3	0.46	0.46	0.45	0.44	0.44	0.44	0.44	0.00	0.00	0.00
Y2-4	0.50	0.50	0.48	0.47	0.47	0.47	0.47	0.00	0.00	0.00
Y2-5	0.47	0.46	0.45	0.44	0.44	0.44	0.44	0.00	0.00	0.00
Y2-6	0.39	0.39	0.37	0.36	0.36	0.36	0.36	0.00	0.00	0.00
Y2-7	0.42	0.42	0.40	0.39	0.39	0.39	0.39	0.00	0.00	0.00

Appendix N – *FAC2* of PM. *L* ranging 0~35.4 m and different condition scenarios

L[m]	0.00	0.60	1.20	1.80	2.40	3.00	3.60	4.20	4.80	5.40
A1-1	0.49	0.52	0.51	0.52	0.52	0.52	0.52	0.51	0.51	0.51
A1-2	0.57	0.61	0.60	0.61	0.61	0.61	0.61	0.60	0.60	0.60
A1-3	0.57	0.62	0.61	0.62	0.62	0.62	0.62	0.61	0.61	0.61
A1-4	0.59	0.63	0.63	0.63	0.63	0.63	0.63	0.62	0.62	0.62
A1-5	0.64	0.69	0.68	0.69	0.69	0.69	0.69	0.68	0.68	0.68
A1-6	0.49	0.52	0.51	0.52	0.52	0.52	0.52	0.51	0.51	0.51
A1-7	0.49	0.53	0.52	0.53	0.53	0.53	0.52	0.52	0.52	0.52
A2-1	0.48	0.51	0.52	0.52	0.52	0.52	0.52	0.51	0.51	0.51
A2-2	0.56	0.60	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60
A2-3	0.56	0.61	0.62	0.62	0.62	0.62	0.62	0.61	0.61	0.61
A2-4	0.58	0.63	0.63	0.63	0.63	0.63	0.63	0.62	0.62	0.62
A2-5	0.63	0.68	0.69	0.69	0.69	0.69	0.69	0.68	0.68	0.68
A2-6	0.48	0.51	0.52	0.52	0.52	0.52	0.52	0.51	0.51	0.51
A2-7	0.48	0.52	0.53	0.53	0.53	0.53	0.52	0.52	0.52	0.52
A4-1	0.49	0.52	0.51	0.52	0.52	0.52	0.52	0.51	0.51	0.51
A4-2	0.58	0.61	0.60	0.61	0.61	0.61	0.61	0.60	0.60	0.60
A4-3	0.58	0.62	0.61	0.62	0.62	0.62	0.62	0.61	0.61	0.61
A4-4	0.60	0.63	0.63	0.63	0.63	0.63	0.63	0.62	0.62	0.62
A4-5	0.65	0.69	0.68	0.69	0.69	0.69	0.69	0.68	0.68	0.68
A4-6	0.49	0.52	0.51	0.52	0.52	0.52	0.52	0.51	0.51	0.51
A4-7	0.50	0.53	0.52	0.53	0.53	0.53	0.52	0.52	0.52	0.52
B1-2	0.59	0.62	0.60	0.61	0.60	0.61	0.61	0.60	0.60	0.60
B2-2	0.59	0.62	0.60	0.61	0.60	0.61	0.61	0.60	0.60	0.60
C1-2	0.61	0.60	0.60	0.59	0.60	0.60	0.60	0.60	0.60	0.62
C2-2	0.59	0.61	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.61
D1-2	0.61	0.59	0.58	0.59	0.59	0.60	0.60	0.60	0.62	0.63
D2-2	0.61	0.59	0.58	0.59	0.59	0.60	0.60	0.60	0.62	0.63
X1-1	0.56	0.64	0.62	0.61	0.61	0.61	0.63	0.63	0.63	0.64
X1-2	0.64	0.73	0.71	0.70	0.69	0.70	0.72	0.72	0.72	0.73
X1-3	0.63	0.72	0.70	0.69	0.68	0.69	0.71	0.71	0.71	0.71
X1-4	0.65	0.76	0.73	0.72	0.71	0.71	0.72	0.72	0.72	0.73
X1-5	0.72	0.83	0.80	0.79	0.78	0.79	0.81	0.81	0.81	0.82
X1-6	0.54	0.62	0.60	0.59	0.59	0.59	0.61	0.61	0.61	0.62
X1-7	0.56	0.65	0.63	0.62	0.62	0.62	0.62	0.62	0.62	0.63
X2-1	0.55	0.64	0.63	0.62	0.61	0.62	0.63	0.63	0.63	0.64
X2-2	0.63	0.73	0.71	0.71	0.70	0.71	0.72	0.72	0.72	0.73
X2-3	0.61	0.72	0.70	0.70	0.69	0.70	0.71	0.71	0.71	0.71
X2-4	0.63	0.76	0.73	0.73	0.72	0.72	0.72	0.72	0.72	0.73
X2-5	0.70	0.83	0.80	0.80	0.79	0.80	0.81	0.81	0.81	0.82
X2-6	0.52	0.62	0.61	0.60	0.59	0.60	0.61	0.61	0.61	0.62
X2-7	0.55	0.65	0.64	0.63	0.62	0.62	0.62	0.62	0.62	0.63
Y1-1	0.40	0.44	0.37	0.36	0.36	0.35	0.36	0.35	0.36	0.37
Y1-2	0.45	0.44	0.34	0.33	0.33	0.33	0.33	0.34	0.36	0.37
Y1-3	0.48	0.47	0.37	0.36	0.36	0.35	0.36	0.37	0.38	0.39
Y1-4	0.52	0.51	0.39	0.38	0.38	0.38	0.38	0.39	0.40	0.40
Y1-5	0.50	0.48	0.36	0.35	0.35	0.35	0.36	0.38	0.40	0.41
Y1-6	0.43	0.47	0.39	0.39	0.39	0.38	0.39	0.37	0.39	0.39
Y1-7	0.46	0.51	0.42	0.42	0.42	0.41	0.42	0.40	0.41	0.41
Y2-1	0.38	0.45	0.40	0.37	0.35	0.35	0.37	0.36	0.36	0.37
Y2-2	0.43	0.46	0.37	0.34	0.33	0.33	0.34	0.35	0.36	0.37
Y2-3	0.46	0.49	0.39	0.37	0.35	0.35	0.37	0.38	0.38	0.39
Y2-4	0.49	0.53	0.42	0.39	0.38	0.38	0.39	0.40	0.40	0.40
Y2-5	0.47	0.50	0.39	0.36	0.35	0.35	0.37	0.39	0.40	0.41
Y2-6	0.41	0.49	0.43	0.40	0.38	0.38	0.39	0.39	0.39	0.39
Y2-7	0.44	0.52	0.46	0.43	0.41	0.41	0.42	0.42	0.41	0.41

Appendix N (cont.)

L[m]	6.00	6.60	7.20	7.80	8.40	9.00	9.60	10.20	10.80	11.40
A1-1	0.54	0.54	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.52
A1-2	0.63	0.63	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.61
A1-3	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.62
A1-4	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.61
A1-5	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.69	0.68
A1-6	0.54	0.54	0.54	0.54	0.54	0.54	0.53	0.53	0.53	0.52
A1-7	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.51
A2-1	0.53	0.54	0.53	0.53	0.53	0.53	0.53	0.52	0.52	0.52
A2-2	0.62	0.63	0.62	0.62	0.62	0.62	0.62	0.61	0.61	0.61
A2-3	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.62	0.62	0.62
A2-4	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.61	0.61	0.61
A2-5	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.69	0.68	0.68
A2-6	0.54	0.54	0.54	0.54	0.54	0.54	0.53	0.52	0.52	0.52
A2-7	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.51	0.51	0.51
A4-1	0.54	0.54	0.53	0.53	0.53	0.53	0.53	0.52	0.52	0.52
A4-2	0.63	0.63	0.62	0.62	0.62	0.62	0.62	0.61	0.61	0.61
A4-3	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.62	0.62	0.62
A4-4	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.61	0.61
A4-5	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.69	0.68	0.68
A4-6	0.54	0.54	0.54	0.54	0.54	0.53	0.53	0.52	0.52	0.52
A4-7	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.51	0.51
B1-2	0.63	0.63	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.61
B2-2	0.63	0.63	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.61
C1-2	0.62	0.61	0.61	0.61	0.61	0.62	0.61	0.61	0.61	0.60
C2-2	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.60
D1-2	0.62	0.62	0.62	0.62	0.63	0.62	0.62	0.62	0.60	0.60
D2-2	0.62	0.62	0.62	0.62	0.63	0.62	0.62	0.62	0.60	0.60
X1-1	0.63	0.64	0.64	0.64	0.65	0.65	0.65	0.65	0.65	0.64
X1-2	0.72	0.72	0.72	0.73	0.73	0.73	0.73	0.73	0.74	0.73
X1-3	0.71	0.71	0.71	0.71	0.72	0.72	0.72	0.72	0.73	0.72
X1-4	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
X1-5	0.81	0.81	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.82
X1-6	0.61	0.62	0.62	0.62	0.63	0.63	0.63	0.63	0.64	0.62
X1-7	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
X2-1	0.63	0.64	0.64	0.64	0.65	0.65	0.65	0.65	0.65	0.64
X2-2	0.72	0.72	0.72	0.73	0.73	0.73	0.73	0.73	0.74	0.73
X2-3	0.71	0.71	0.71	0.71	0.72	0.72	0.72	0.72	0.73	0.72
X2-4	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
X2-5	0.81	0.81	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.82
X2-6	0.61	0.62	0.62	0.62	0.63	0.63	0.63	0.63	0.64	0.62
X2-7	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Y1-1	0.37	0.39	0.39	0.39	0.39	0.39	0.40	0.42	0.45	0.43
Y1-2	0.38	0.38	0.38	0.38	0.39	0.39	0.40	0.43	0.46	0.44
Y1-3	0.40	0.41	0.41	0.41	0.42	0.42	0.43	0.46	0.49	0.47
Y1-4	0.41	0.42	0.42	0.43	0.43	0.42	0.42	0.45	0.47	0.45
Y1-5	0.42	0.43	0.43	0.43	0.44	0.44	0.45	0.48	0.50	0.49
Y1-6	0.40	0.41	0.41	0.41	0.42	0.42	0.43	0.45	0.48	0.46
Y1-7	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.44	0.45	0.44
Y2-1	0.38	0.38	0.39	0.39	0.39	0.39	0.40	0.42	0.45	0.43
Y2-2	0.38	0.38	0.38	0.38	0.39	0.39	0.40	0.43	0.46	0.45
Y2-3	0.41	0.41	0.41	0.41	0.42	0.42	0.43	0.46	0.49	0.48
Y2-4	0.42	0.42	0.42	0.43	0.43	0.43	0.42	0.45	0.47	0.46
Y2-5	0.43	0.43	0.43	0.43	0.44	0.44	0.45	0.48	0.50	0.50
Y2-6	0.41	0.41	0.41	0.41	0.42	0.42	0.43	0.45	0.48	0.46
Y2-7	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.44	0.45	0.44

Appendix N (cont.)

L[m]	12.00	12.60	13.20	13.80	14.40	15.00	15.60	16.20	16.80	17.40
A1-1	0.51	0.51	0.51	0.50	0.50	0.50	0.48	0.47	0.47	0.46
A1-2	0.60	0.60	0.60	0.59	0.59	0.59	0.58	0.57	0.56	0.55
A1-3	0.61	0.61	0.61	0.60	0.60	0.60	0.59	0.58	0.56	0.56
A1-4	0.60	0.60	0.60	0.59	0.59	0.59	0.58	0.57	0.57	0.57
A1-5	0.67	0.67	0.67	0.66	0.66	0.66	0.64	0.63	0.61	0.60
A1-6	0.51	0.51	0.51	0.51	0.51	0.51	0.49	0.49	0.47	0.47
A1-7	0.50	0.50	0.50	0.49	0.49	0.49	0.48	0.48	0.48	0.48
A2-1	0.51	0.51	0.50	0.50	0.50	0.50	0.49	0.47	0.46	0.46
A2-2	0.59	0.59	0.59	0.59	0.59	0.59	0.58	0.57	0.55	0.55
A2-3	0.60	0.60	0.60	0.60	0.60	0.60	0.59	0.58	0.56	0.56
A2-4	0.59	0.59	0.59	0.59	0.59	0.59	0.58	0.57	0.57	0.57
A2-5	0.66	0.66	0.66	0.66	0.66	0.66	0.65	0.63	0.61	0.60
A2-6	0.51	0.51	0.51	0.51	0.51	0.51	0.49	0.49	0.47	0.47
A2-7	0.49	0.49	0.49	0.49	0.49	0.49	0.48	0.48	0.48	0.48
A4-1	0.51	0.50	0.51	0.50	0.50	0.50	0.48	0.47	0.47	0.46
A4-2	0.59	0.59	0.60	0.59	0.59	0.59	0.58	0.56	0.56	0.55
A4-3	0.60	0.60	0.61	0.60	0.60	0.60	0.59	0.57	0.56	0.56
A4-4	0.59	0.59	0.60	0.59	0.59	0.59	0.58	0.57	0.57	0.57
A4-5	0.66	0.66	0.67	0.66	0.66	0.66	0.64	0.62	0.61	0.60
A4-6	0.51	0.51	0.51	0.51	0.51	0.51	0.49	0.48	0.47	0.47
A4-7	0.49	0.49	0.50	0.49	0.49	0.49	0.48	0.48	0.48	0.48
B1-2	0.60	0.59	0.59	0.58	0.58	0.58	0.56	0.56	0.55	0.55
B2-2	0.60	0.59	0.59	0.58	0.58	0.58	0.56	0.56	0.55	0.55
C1-2	0.60	0.59	0.59	0.58	0.57	0.55	0.55	0.54	0.53	0.55
C2-2	0.60	0.59	0.59	0.58	0.57	0.55	0.55	0.54	0.53	0.54
D1-2	0.60	0.58	0.58	0.57	0.55	0.54	0.55	0.54	0.55	0.54
D2-2	0.60	0.58	0.58	0.57	0.55	0.54	0.55	0.54	0.55	0.54
X1-1	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.61	0.60	0.60
X1-2	0.73	0.73	0.73	0.72	0.72	0.72	0.72	0.71	0.69	0.69
X1-3	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.70	0.69	0.69
X1-4	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.70	0.69	0.69
X1-5	0.81	0.81	0.81	0.80	0.80	0.80	0.80	0.79	0.77	0.76
X1-6	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.59	0.59	0.59
X1-7	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.60	0.59	0.59
X2-1	0.63	0.63	0.63	0.63	0.63	0.63	0.62	0.62	0.61	0.61
X2-2	0.73	0.73	0.73	0.72	0.72	0.72	0.72	0.72	0.70	0.70
X2-3	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.70	0.69
X2-4	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.70	0.69
X2-5	0.81	0.81	0.81	0.80	0.80	0.80	0.80	0.80	0.78	0.77
X2-6	0.61	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.59	0.59
X2-7	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.60	0.59
Y1-1	0.43	0.42	0.44	0.44	0.43	0.43	0.44	0.44	0.45	0.45
Y1-2	0.45	0.44	0.47	0.48	0.49	0.49	0.49	0.48	0.50	0.51
Y1-3	0.48	0.47	0.50	0.51	0.51	0.51	0.51	0.50	0.52	0.53
Y1-4	0.45	0.45	0.48	0.49	0.49	0.49	0.49	0.48	0.50	0.51
Y1-5	0.50	0.49	0.51	0.52	0.54	0.54	0.54	0.53	0.55	0.56
Y1-6	0.46	0.45	0.47	0.47	0.45	0.45	0.45	0.44	0.45	0.46
Y1-7	0.43	0.43	0.45	0.45	0.43	0.43	0.43	0.42	0.44	0.45
Y2-1	0.43	0.43	0.43	0.44	0.44	0.43	0.44	0.43	0.45	0.45
Y2-2	0.46	0.45	0.46	0.48	0.49	0.49	0.49	0.49	0.51	0.51
Y2-3	0.49	0.48	0.49	0.51	0.51	0.51	0.51	0.51	0.53	0.53
Y2-4	0.46	0.46	0.47	0.49	0.49	0.49	0.49	0.49	0.51	0.51
Y2-5	0.50	0.50	0.50	0.52	0.54	0.54	0.54	0.54	0.56	0.56
Y2-6	0.46	0.46	0.46	0.47	0.46	0.45	0.45	0.44	0.46	0.46
Y2-7	0.44	0.44	0.45	0.45	0.44	0.43	0.43	0.43	0.45	0.45

Appendix N (cont.)

L[m]	18.00	18.60	19.20	19.80	20.40	21.00	21.60	22.20	22.80	23.40
A1-1	0.47	0.47	0.46	0.47	0.47	0.47	0.47	0.47	0.48	0.48
A1-2	0.56	0.56	0.55	0.56	0.56	0.56	0.57	0.56	0.58	0.58
A1-3	0.57	0.56	0.56	0.57	0.57	0.57	0.57	0.56	0.58	0.58
A1-4	0.58	0.57	0.57	0.58	0.58	0.58	0.58	0.58	0.60	0.60
A1-5	0.61	0.61	0.60	0.61	0.61	0.61	0.62	0.61	0.63	0.63
A1-6	0.48	0.47	0.47	0.48	0.48	0.48	0.48	0.47	0.49	0.49
A1-7	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.50	0.50
A2-1	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.47	0.48	0.48
A2-2	0.55	0.55	0.55	0.55	0.56	0.57	0.56	0.57	0.58	0.58
A2-3	0.56	0.56	0.56	0.56	0.57	0.57	0.56	0.57	0.58	0.58
A2-4	0.57	0.57	0.57	0.57	0.58	0.58	0.58	0.59	0.60	0.60
A2-5	0.60	0.60	0.60	0.60	0.61	0.62	0.61	0.62	0.63	0.63
A2-6	0.47	0.47	0.47	0.47	0.48	0.48	0.47	0.48	0.49	0.49
A2-7	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.49	0.50	0.50
A4-1	0.46	0.47	0.46	0.46	0.47	0.47	0.47	0.47	0.49	0.48
A4-2	0.55	0.56	0.55	0.55	0.56	0.57	0.56	0.56	0.58	0.58
A4-3	0.56	0.56	0.56	0.56	0.57	0.57	0.56	0.56	0.59	0.58
A4-4	0.57	0.57	0.57	0.57	0.58	0.58	0.58	0.58	0.61	0.60
A4-5	0.60	0.61	0.60	0.60	0.61	0.62	0.61	0.61	0.64	0.63
A4-6	0.47	0.47	0.47	0.47	0.48	0.48	0.47	0.47	0.49	0.49
A4-7	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.51	0.50
B1-2	0.54	0.55	0.55	0.55	0.56	0.55	0.56	0.57	0.58	0.58
B2-2	0.54	0.55	0.55	0.55	0.56	0.55	0.56	0.57	0.58	0.58
C1-2	0.55	0.56	0.57	0.55	0.55	0.56	0.56	0.56	0.55	0.55
C2-2	0.55	0.57	0.56	0.55	0.55	0.56	0.56	0.56	0.56	0.54
D1-2	0.54	0.54	0.57	0.57	0.56	0.55	0.54	0.54	0.55	0.55
D2-2	0.54	0.54	0.57	0.57	0.56	0.55	0.54	0.54	0.55	0.55
X1-1	0.59	0.59	0.58	0.59	0.58	0.58	0.59	0.59	0.59	0.59
X1-2	0.69	0.69	0.68	0.69	0.68	0.68	0.70	0.70	0.70	0.71
X1-3	0.69	0.69	0.68	0.69	0.68	0.68	0.70	0.70	0.70	0.71
X1-4	0.69	0.69	0.69	0.70	0.70	0.70	0.72	0.72	0.72	0.73
X1-5	0.76	0.76	0.75	0.76	0.75	0.75	0.77	0.77	0.77	0.78
X1-6	0.59	0.59	0.58	0.59	0.58	0.58	0.59	0.59	0.59	0.59
X1-7	0.59	0.59	0.59	0.60	0.60	0.60	0.62	0.62	0.61	0.62
X2-1	0.59	0.59	0.58	0.59	0.58	0.58	0.59	0.59	0.59	0.59
X2-2	0.69	0.69	0.68	0.69	0.68	0.68	0.70	0.70	0.71	0.71
X2-3	0.69	0.69	0.68	0.69	0.68	0.68	0.70	0.70	0.71	0.71
X2-4	0.69	0.69	0.69	0.70	0.70	0.70	0.72	0.72	0.73	0.73
X2-5	0.76	0.76	0.75	0.76	0.75	0.75	0.77	0.77	0.78	0.78
X2-6	0.59	0.59	0.58	0.59	0.58	0.58	0.59	0.59	0.59	0.59
X2-7	0.59	0.59	0.59	0.60	0.60	0.60	0.62	0.62	0.62	0.62
Y1-1	0.46	0.47	0.49	0.49	0.48	0.47	0.47	0.47	0.47	0.47
Y1-2	0.52	0.53	0.55	0.56	0.55	0.54	0.55	0.55	0.54	0.54
Y1-3	0.54	0.54	0.57	0.58	0.57	0.57	0.57	0.57	0.56	0.56
Y1-4	0.53	0.54	0.57	0.58	0.58	0.58	0.58	0.58	0.57	0.57
Y1-5	0.57	0.58	0.60	0.61	0.60	0.59	0.60	0.60	0.59	0.59
Y1-6	0.46	0.47	0.49	0.50	0.49	0.49	0.49	0.49	0.49	0.49
Y1-7	0.46	0.47	0.49	0.50	0.50	0.50	0.50	0.50	0.49	0.49
Y2-1	0.47	0.47	0.49	0.49	0.48	0.48	0.47	0.47	0.47	0.46
Y2-2	0.53	0.53	0.55	0.56	0.55	0.55	0.55	0.55	0.54	0.53
Y2-3	0.54	0.54	0.57	0.58	0.57	0.57	0.57	0.57	0.56	0.55
Y2-4	0.53	0.54	0.57	0.58	0.58	0.58	0.58	0.58	0.57	0.57
Y2-5	0.58	0.58	0.60	0.61	0.60	0.60	0.60	0.60	0.59	0.58
Y2-6	0.47	0.47	0.49	0.50	0.49	0.49	0.49	0.49	0.49	0.48
Y2-7	0.46	0.47	0.49	0.50	0.50	0.50	0.50	0.50	0.49	0.49

Appendix N (cont.)

L[m]	24.00	24.60	25.20	25.80	26.40	27.00	27.60	28.20	28.80	29.40
A1-1	0.48	0.49	0.48	0.48	0.47	0.47	0.47	0.47	0.47	0.47
A1-2	0.58	0.58	0.58	0.58	0.57	0.57	0.56	0.56	0.56	0.56
A1-3	0.58	0.59	0.58	0.58	0.57	0.57	0.57	0.57	0.57	0.57
A1-4	0.60	0.61	0.60	0.60	0.59	0.59	0.59	0.59	0.59	0.59
A1-5	0.63	0.64	0.63	0.63	0.62	0.62	0.62	0.62	0.62	0.62
A1-6	0.49	0.49	0.49	0.49	0.48	0.48	0.48	0.48	0.48	0.48
A1-7	0.50	0.51	0.50	0.50	0.49	0.49	0.49	0.49	0.49	0.49
A2-1	0.48	0.49	0.48	0.49	0.47	0.47	0.47	0.47	0.47	0.47
A2-2	0.58	0.58	0.58	0.58	0.57	0.57	0.56	0.56	0.56	0.56
A2-3	0.58	0.59	0.58	0.59	0.57	0.57	0.57	0.57	0.57	0.57
A2-4	0.60	0.61	0.60	0.61	0.59	0.59	0.59	0.59	0.59	0.59
A2-5	0.63	0.64	0.63	0.64	0.62	0.62	0.62	0.62	0.62	0.62
A2-6	0.49	0.49	0.49	0.49	0.48	0.48	0.48	0.48	0.48	0.48
A2-7	0.50	0.51	0.50	0.51	0.49	0.49	0.49	0.49	0.49	0.49
A4-1	0.47	0.49	0.48	0.48	0.47	0.47	0.47	0.47	0.47	0.47
A4-2	0.57	0.58	0.58	0.58	0.57	0.56	0.56	0.56	0.56	0.57
A4-3	0.57	0.59	0.58	0.58	0.57	0.57	0.57	0.57	0.57	0.58
A4-4	0.59	0.61	0.60	0.60	0.59	0.59	0.59	0.59	0.59	0.60
A4-5	0.62	0.64	0.63	0.63	0.62	0.62	0.62	0.62	0.62	0.63
A4-6	0.48	0.49	0.49	0.49	0.48	0.48	0.48	0.48	0.48	0.49
A4-7	0.49	0.51	0.50	0.50	0.49	0.49	0.49	0.49	0.49	0.50
B1-2	0.57	0.57	0.58	0.58	0.56	0.56	0.56	0.56	0.54	0.54
B2-2	0.57	0.57	0.58	0.58	0.56	0.56	0.56	0.56	0.54	0.54
C1-2	0.56	0.56	0.56	0.57	0.58	0.53	0.53	0.53	0.53	0.54
C2-2	0.56	0.56	0.56	0.57	0.58	0.55	0.53	0.53	0.53	0.54
D1-2	0.53	0.53	0.53	0.54	0.54	0.54	0.53	0.53	0.53	0.53
D2-2	0.53	0.53	0.53	0.54	0.54	0.54	0.53	0.53	0.53	0.53
X1-1	0.59	0.58	0.57	0.57	0.57	0.57	0.56	0.55	0.55	0.55
X1-2	0.71	0.69	0.69	0.69	0.69	0.68	0.68	0.66	0.67	0.67
X1-3	0.71	0.70	0.70	0.70	0.70	0.69	0.69	0.67	0.68	0.68
X1-4	0.73	0.72	0.72	0.72	0.72	0.71	0.71	0.69	0.70	0.70
X1-5	0.78	0.76	0.76	0.76	0.76	0.75	0.75	0.73	0.74	0.74
X1-6	0.59	0.59	0.58	0.58	0.58	0.57	0.57	0.56	0.56	0.56
X1-7	0.62	0.61	0.60	0.60	0.60	0.59	0.59	0.58	0.58	0.58
X2-1	0.59	0.59	0.57	0.57	0.57	0.57	0.56	0.55	0.56	0.55
X2-2	0.71	0.70	0.69	0.69	0.69	0.68	0.68	0.67	0.68	0.67
X2-3	0.71	0.70	0.70	0.70	0.70	0.69	0.69	0.68	0.69	0.68
X2-4	0.73	0.72	0.72	0.72	0.72	0.71	0.71	0.70	0.71	0.70
X2-5	0.78	0.77	0.76	0.76	0.76	0.75	0.75	0.74	0.75	0.74
X2-6	0.59	0.59	0.58	0.58	0.58	0.57	0.57	0.56	0.57	0.56
X2-7	0.62	0.61	0.60	0.60	0.60	0.59	0.59	0.58	0.59	0.58
Y1-1	0.47	0.47	0.47	0.47	0.47	0.48	0.48	0.47	0.46	0.47
Y1-2	0.54	0.55	0.55	0.54	0.55	0.56	0.56	0.55	0.54	0.56
Y1-3	0.56	0.57	0.56	0.55	0.55	0.55	0.55	0.55	0.55	0.56
Y1-4	0.58	0.59	0.58	0.57	0.57	0.57	0.57	0.57	0.57	0.58
Y1-5	0.59	0.60	0.60	0.59	0.60	0.61	0.61	0.61	0.60	0.62
Y1-6	0.49	0.49	0.49	0.48	0.48	0.48	0.48	0.48	0.47	0.47
Y1-7	0.50	0.51	0.50	0.49	0.49	0.49	0.49	0.49	0.48	0.48
Y2-1	0.48	0.47	0.47	0.46	0.47	0.48	0.48	0.47	0.47	0.47
Y2-2	0.56	0.55	0.54	0.53	0.55	0.56	0.56	0.55	0.55	0.56
Y2-3	0.58	0.57	0.56	0.55	0.55	0.55	0.55	0.55	0.55	0.56
Y2-4	0.60	0.59	0.58	0.57	0.57	0.57	0.57	0.57	0.57	0.58
Y2-5	0.61	0.60	0.59	0.58	0.60	0.61	0.61	0.61	0.61	0.62
Y2-6	0.50	0.49	0.49	0.48	0.48	0.48	0.48	0.48	0.47	0.47
Y2-7	0.52	0.51	0.50	0.49	0.49	0.49	0.49	0.49	0.48	0.48

Appendix N (cont.)

L[m]	30.00	30.60	31.20	31.80	32.40	33.00	33.60	34.20	34.80	35.40
A1-1	0.45	0.43	0.41	0.41	0.41	0.41	0.41	0.41	0.42	0.42
A1-2	0.53	0.52	0.49	0.48	0.48	0.49	0.49	0.49	0.50	0.50
A1-3	0.54	0.54	0.51	0.50	0.50	0.51	0.51	0.51	0.52	0.52
A1-4	0.57	0.56	0.53	0.52	0.52	0.53	0.53	0.53	0.54	0.54
A1-5	0.59	0.57	0.54	0.53	0.53	0.54	0.54	0.54	0.55	0.55
A1-6	0.46	0.45	0.43	0.42	0.42	0.43	0.43	0.43	0.44	0.44
A1-7	0.48	0.47	0.45	0.44	0.44	0.45	0.45	0.45	0.45	0.45
A2-1	0.46	0.45	0.41	0.41	0.41	0.41	0.41	0.41	0.42	0.42
A2-2	0.55	0.53	0.49	0.49	0.48	0.49	0.49	0.49	0.50	0.50
A2-3	0.56	0.54	0.51	0.51	0.50	0.51	0.51	0.51	0.52	0.52
A2-4	0.58	0.56	0.53	0.53	0.52	0.53	0.53	0.53	0.54	0.54
A2-5	0.61	0.59	0.54	0.54	0.53	0.54	0.54	0.54	0.55	0.55
A2-6	0.47	0.46	0.43	0.43	0.42	0.43	0.43	0.43	0.44	0.44
A2-7	0.48	0.47	0.45	0.45	0.44	0.45	0.45	0.45	0.45	0.45
A4-1	0.45	0.43	0.41	0.41	0.41	0.41	0.41	0.41	0.42	0.42
A4-2	0.53	0.51	0.48	0.48	0.48	0.49	0.49	0.49	0.50	0.50
A4-3	0.55	0.53	0.50	0.50	0.50	0.51	0.51	0.51	0.52	0.52
A4-4	0.58	0.55	0.52	0.52	0.52	0.53	0.53	0.53	0.54	0.54
A4-5	0.59	0.56	0.53	0.53	0.53	0.54	0.54	0.54	0.55	0.55
A4-6	0.46	0.44	0.42	0.42	0.42	0.43	0.43	0.43	0.44	0.44
A4-7	0.48	0.46	0.44	0.44	0.44	0.45	0.45	0.45	0.45	0.45
B1-2	0.54	0.51	0.49	0.48	0.49	0.49	0.49	0.49	0.50	0.50
B2-2	0.54	0.51	0.49	0.48	0.49	0.49	0.49	0.49	0.50	0.50
C1-2	0.53	0.52	0.49	0.49	0.49	0.49	0.49	0.50	0.50	0.50
C2-2	0.53	0.52	0.49	0.49	0.49	0.49	0.49	0.50	0.50	0.50
D1-2	0.53	0.52	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.49
D2-2	0.53	0.52	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.49
X1-1	0.55	0.53	0.53	0.52	0.52	0.52	0.52	0.51	0.51	0.50
X1-2	0.66	0.64	0.64	0.63	0.63	0.63	0.63	0.61	0.61	0.60
X1-3	0.67	0.65	0.65	0.64	0.64	0.64	0.64	0.63	0.63	0.63
X1-4	0.69	0.68	0.68	0.67	0.67	0.67	0.67	0.66	0.66	0.65
X1-5	0.73	0.71	0.71	0.70	0.70	0.70	0.70	0.68	0.68	0.67
X1-6	0.56	0.54	0.54	0.54	0.54	0.54	0.54	0.53	0.53	0.52
X1-7	0.58	0.57	0.57	0.56	0.56	0.56	0.56	0.55	0.55	0.55
X2-1	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.51
X2-2	0.66	0.65	0.65	0.63	0.63	0.63	0.63	0.62	0.61	0.61
X2-3	0.67	0.66	0.66	0.64	0.64	0.64	0.64	0.64	0.63	0.63
X2-4	0.69	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.66	0.66
X2-5	0.73	0.72	0.72	0.70	0.70	0.70	0.70	0.69	0.68	0.68
X2-6	0.56	0.55	0.55	0.54	0.54	0.54	0.54	0.54	0.53	0.53
X2-7	0.58	0.57	0.57	0.56	0.56	0.56	0.56	0.56	0.55	0.55
Y1-1	0.47	0.48	0.48	0.50	0.49	0.51	0.51	0.50	0.50	0.49
Y1-2	0.57	0.58	0.58	0.60	0.59	0.61	0.61	0.60	0.60	0.59
Y1-3	0.57	0.58	0.58	0.61	0.60	0.62	0.62	0.61	0.61	0.60
Y1-4	0.59	0.60	0.60	0.63	0.62	0.63	0.63	0.63	0.63	0.63
Y1-5	0.63	0.64	0.64	0.67	0.66	0.68	0.68	0.67	0.67	0.66
Y1-6	0.48	0.49	0.49	0.51	0.50	0.51	0.51	0.51	0.51	0.50
Y1-7	0.49	0.50	0.50	0.52	0.52	0.53	0.53	0.53	0.53	0.52
Y2-1	0.47	0.48	0.48	0.50	0.49	0.51	0.51	0.50	0.51	0.49
Y2-2	0.57	0.58	0.58	0.60	0.59	0.61	0.61	0.60	0.61	0.59
Y2-3	0.57	0.58	0.58	0.61	0.60	0.62	0.62	0.61	0.62	0.60
Y2-4	0.59	0.60	0.60	0.63	0.62	0.63	0.63	0.63	0.63	0.63
Y2-5	0.63	0.64	0.64	0.67	0.66	0.68	0.68	0.67	0.68	0.66
Y2-6	0.48	0.49	0.49	0.51	0.50	0.51	0.51	0.51	0.51	0.50
Y2-7	0.49	0.50	0.50	0.52	0.52	0.53	0.53	0.52	0.53	0.52

Glossary

Concentration ratio: model-predicted concentration of a sampler over model-predicted concentration of reference point T1-1.

***FAC2*:** Fraction of predictions within a factor of two of observations

Fan direction: The direction was normal to the surface of the fan.

Fan wind direction: the direction of wind from the fan.

Model-predicted concentration: the concentrations calculated by assuming strength equals to real value, and adjusted by observed background concentration.

Optimal L: The *L* that gives maximum *FAC2* of the model.

Primary model-predicted concentration (PMp): the concentrations calculated by assuming strength equals to one.

Secondary model-predicted concentration (SMp): the concentrations calculated by assuming strength equals to real value.

Ratio of difference: the difference between a model-predicted concentration of a given point under wind speed scenario or *L* of interest over model-predicted concentration of sampler Sn under condition of "A1 and *L* = 6.6 m" condition.

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