Title

Variability of Airborne Ultrafine Particles in Number and Size within the Urban Neighbourhoods Close to a Major European Airport.

Abstract Meta

| relevant for topics: | Air Quality or Characterization | |
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| author: | Seidler, Julius ^{a,b} Friedrich, Markus ^{a,b} Vogel, Alexander ^d Thomas, Christoph ^{a,c} Nölscher, Anke ^{a,b} | julius.seidler@uni-bayreuth.de / +49921/55-5724 |
| institute: | ^a University of Bayreuth Bayreuth Center of Ecology and Environmental Research (BayCEER) ^b Atmospheric Chemistry / ^c Micrometeorology | |
| | ^d Goethe-University Frankfurt Institute for Atmospheric and Environmental Sciences | |

Abstract Body

During the past two decades multiple studies highlighted the possible contribution of airports to atmospheric ultrafine particles (UFP) next to other anthropogenic and natural sources. UFP are in the size range of 100 nm or less and can be either liquid or solid. When airborne, UFP can have multiple effects on climate, weather and air quality i.e. when impacting cloud formation as condensation nuclei, altering chemical processes in the atmosphere, or being aspirated or taken up.

Here, we aim to investigate to what extent a major airport contributes to the overall atmospheric UFP mixture in the surrounding neighbourhoods. Our study further elucidates the real-world UFP mixture including air traffic, airport facilities, associated near-ground traffic, and adjacent urban and biogenic UFP sources.

Therefore we designed and established two monitoring stations on a North-South axis to Munich Airport, with a station-to-runway distance of 2 and 2.5 km. Both stations are equipped for continuously measuring UFP by means of a mobility particle size spectrometer (MPSS, 8...800 nm). A total condensation particle counter (CPC, 8...3000 nm) is used for reference and quality control. The setup is completed by meteorological measurements (wind speed and direction, precipitation, solar radiation, humidity, pressure and temperature) which are crucial parameters for exploring transport and mixing processes.

Deployed during Summer 2021, we will present as first results time series of UFP number size distributions and how they are connected to atmospheric conditions, wind speed and direction in particular as well as airport operation and other emission sectors in the surroundings.

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