

# UK (CEH) and ACTRIS



Aerosols, Clouds, and Trace gases Research InfraStructure Network

WP3: In-situ chemical, physical and optical properties of aerosols

WP4: Trace gases networking: Volatile organic carbon and nitrogen oxides

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## WP3: In-situ chemical, physical and optical properties of aerosols

- Implementation of existing and development of new protocols for particle number size distributions and aerosol optical properties
- Implementation of sampling and analysis of organic and elemental carbon and organic tracers for source identification
- Development of measurement protocols for cloud condensation nuclei measurements

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## WP4: Trace gases networking: Volatile organic carbon and nitrogen oxides

- integrate and harmonise trace gas measurements in Europe
- implement standardised measurement protocols (SOPs) and common European calibration scales for VOCs and NO<sub>x</sub> in support of the European EMEP and global GAW strategy and according to data quality objectives formulated by these initiatives.

# UK (CEH) and ACTRIS

WP4: Trace gases networking: Volatile organic carbon and nitrogen oxides

Two UK 'rural' sites: Auchencorth and Harwell, plus NCAS observatory in Cape Verde Islands

Both UK sites are EMEP 'supersites'

First round-robin calibrations for NO<sub>x</sub> and VOCs in progress

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Auchencorth: EMEP 'Level 3' south Scotland

Available for transnational access under ACTRIS



# AUCHENCORTH (UK): CURRENT STATUS (VOC)

## NMHCs (from 2006)

C2: ethane, ethene, ethyne

C3: propane, propene

C4: n-butane, isobutane, 1,3-butadiene, 1-butene, cis/trans-2-butene

C5: n-pentane, isopentane, cis-2-pentene, isoprene

C6: n-hexane, 2/3-methyl pentane

C7+: n-heptane, n-octane, isooctane

Arom: benzene, toluene, xylenes, trimethyl benzene, ethyl benzene



## Quality assurance:

**Instrument:** GC-FID

**Preconcentration:** PE TurboMatrix

Sample volume: 0.6 liter, trap at -30 °C, trap material CarbosorbB/Carbosieve SIII

**Water removal:** Nafion dryer

**Scale:** NPL, ppb standard, 30-components

**Calibration interval:** 4x 1h every 2 wk

## Quality checks:

routine checks: daily chromatography

final checks: quarterly

**Database:** UKAIR, EMEP

**Measurement instruction:** no

**Other issues:** operated remotely by VNC

# AUCHENCORTH (UK) CURRENT STATUS (NO<sub>XY</sub>)

from 2011

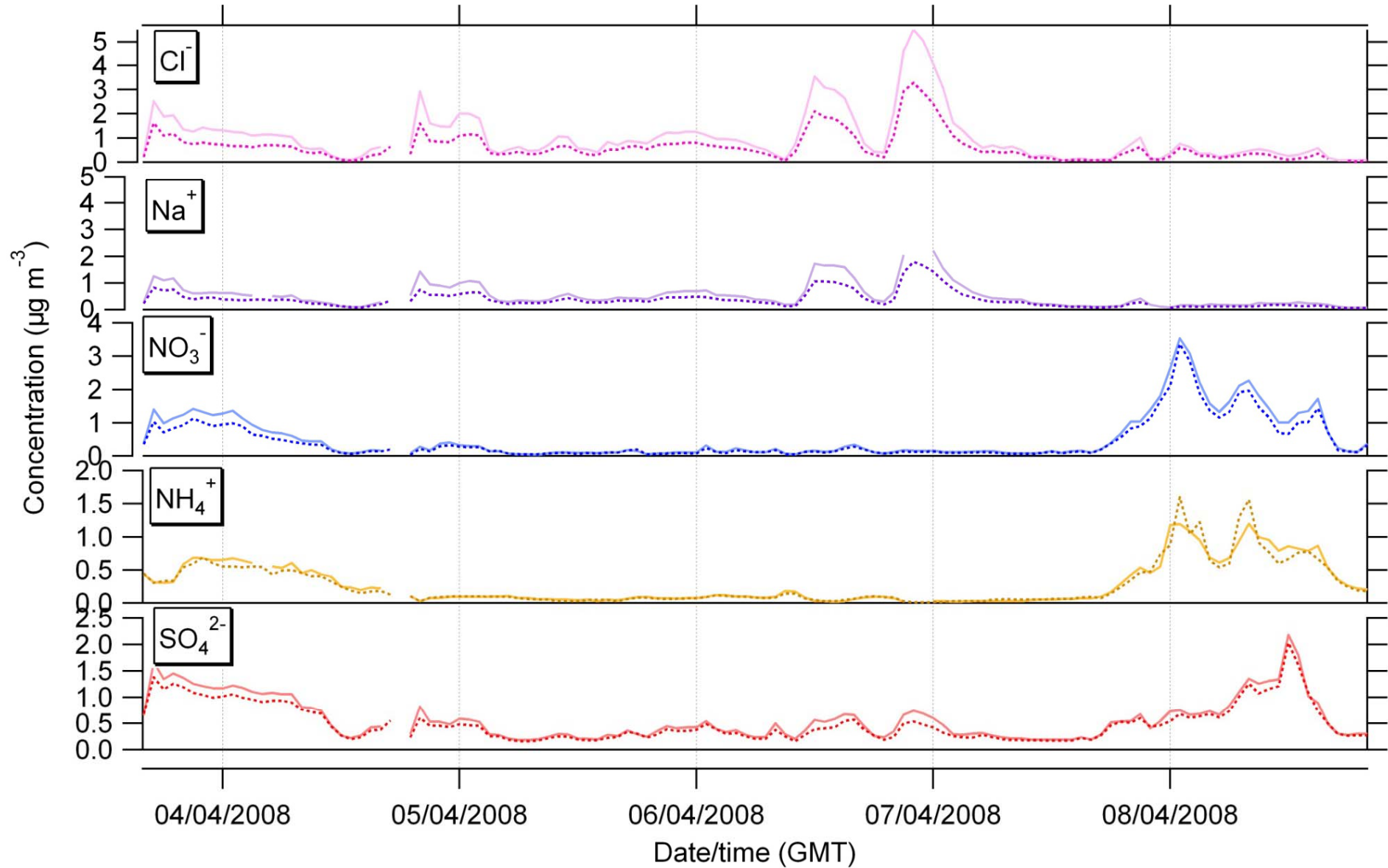
	<b>NO</b>	<b>NO2</b>	<b>HONO/HNO3</b>
<b>instrument/ measurement principle</b>	ECO Physics CLD 770 AL ppt O <sub>3</sub> chemiluminescence	ECO Physics CLD 770 AL ppt with <b>PLC 760 (Xe-Lamp)</b>	MARGA (x2) Wet denuder/IC
<b>scale</b>	BOC ppm in N <sub>2</sub>	Permeation tube	Int std
<b>calibration interval</b>	monthly	monthly	Hourly int.std.
<b>quality checks</b>	check of chamber temp, pressure, flow, on daily basis; lab journal (electronic)		Daily operation check; weekly chromatogram check
<b>intercomparisons</b>	On-site with thermal converter NOX calibrated from same standards		Monthly with integrating denuder
<b>database</b>	UKAIR, EMEP		
<b>measurement instruction</b>	yes		
<b>other issues</b> (thermal NO <sub>x</sub> )	2 instruments	Mo-conv.	PM2.5 and PM10 channels

# AUCHENCORTH (UK) CURRENT STATUS (AEROSOLS)

<b>Instrument/ measurement principle</b>	SMPS (from May2012)	Aethalometer	MARGA (x2) Wet denuder/IC	Q-AMS (aerosol mass spectrometer) <b>Only during intensive field campaigns</b>
<b>What they measure</b>	Size distribution of particles in the size range from 10n to 800 nm	Black carbon (PM2.5)	NO <sub>3</sub> <sup>-</sup> , SO <sub>4</sub> <sup>2-</sup> , Cl <sup>-</sup> , NH <sub>4</sub> <sup>+</sup> , Na <sup>+</sup> , K <sup>+</sup> , Mg <sup>+</sup> , Ca <sup>2+</sup> (PM10, PM2.5 inlets)	Chemical speciation and size distribution of non-refractory <1µm particles
<b>Time resolution</b>	1 min	5 min	hourly	Up to 10Hz
<b>database</b>	UKAIR, EMEP			



# Time Series



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Harwell: EMEP 'Level 2' south England



# HARWELL(UK) CURRENT STATUS (AEROSOLS)

<b>Instrument/ measurement principle</b>	MARGA (x2) Wet denuder/IC	ToF-AMS (aerosol mass spectrometer) <b>Only during intensive field campaigns</b>
<b>What they measure</b>	NO <sub>3</sub> <sup>-</sup> , SO <sub>4</sub> <sup>2-</sup> , Cl <sup>-</sup> , ,NH <sub>4</sub> <sup>+</sup> , Na <sup>+</sup> , K <sup>+</sup> , Mg <sup>+</sup> , Ca <sup>2+</sup> (PM10, PM2.5 inlets)	Chemical speciation and size distribution of non-refractory <1µm particles
<b>Time resolution</b>	hourly	Up to 10Hz
<b>database</b>	UKAIR, EMEP	