

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_x in support of the European EMEP and global GAW strategy and according to data quality objectives formulated by these initiatives.

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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_x 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_{XY})

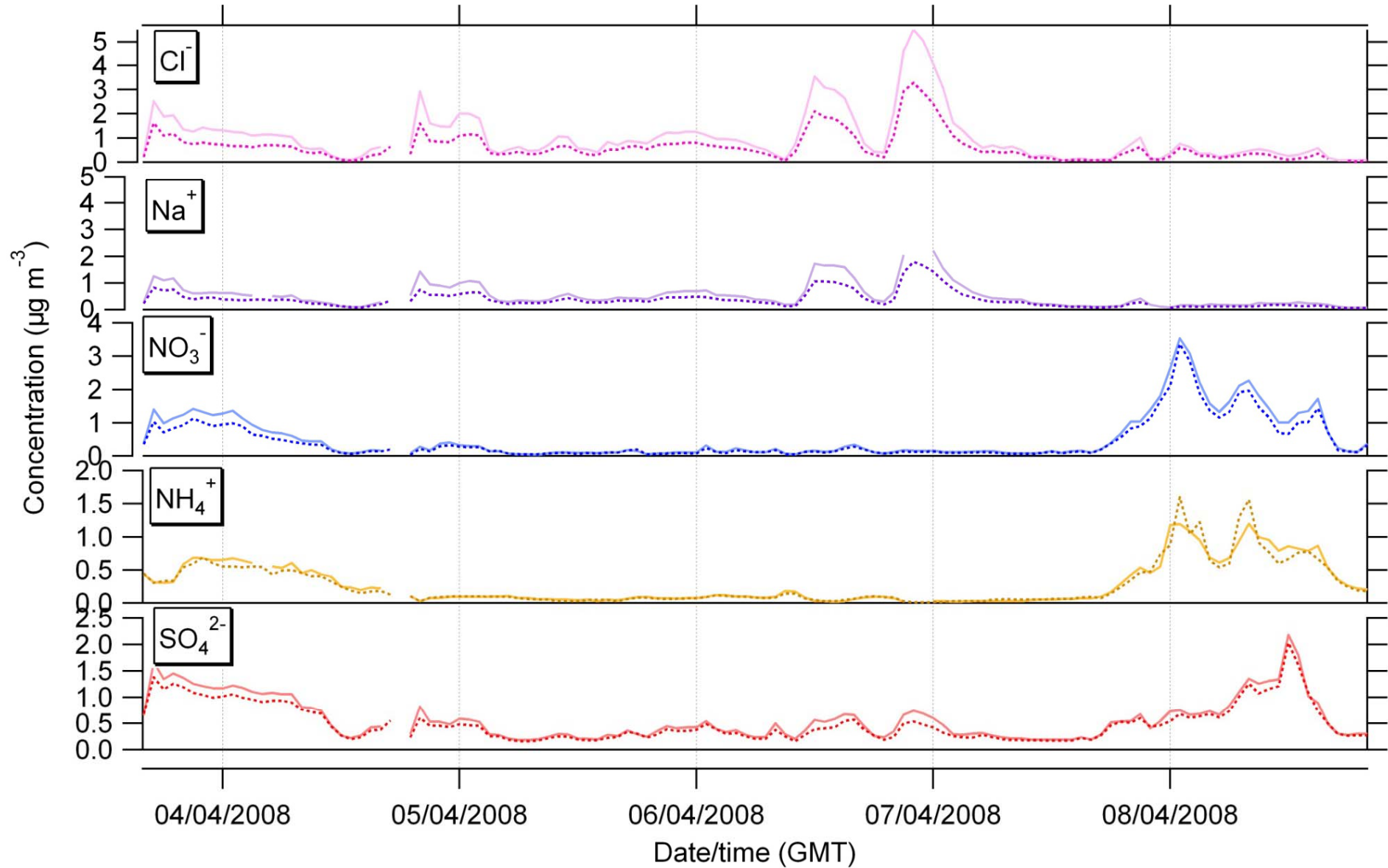
from 2011

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

AUCHENCORTH (UK) CURRENT STATUS (AEROSOLS)

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

Time Series



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Harwell: EMEP 'Level 2' south England



HARWELL(UK) CURRENT STATUS (AEROSOLS)

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