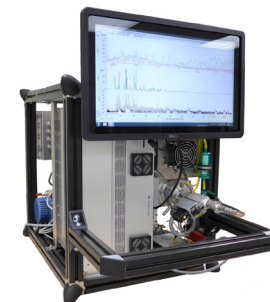




WP8: TNA3: European Centre for Aerosol Calibration (ECAC) Aerosol Chemical Monitor Calibration Centre (ACMCC)



Laboratoire des Sciences du Climat et de l'Environnement
LSCE (UMR 8212)



*ACTRIS-2 WP3 / WP8 / WP11 Technical Meeting
Athens, Greece
November 10-12, 2015*



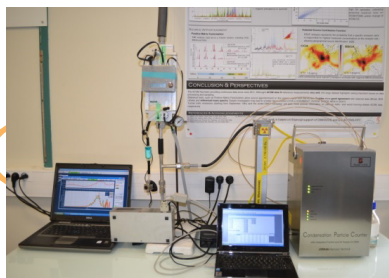
SIRTA Station



- ❖ Located 25 km south-west from Paris
- ❖ Remote sensing measurements performed at Ecole polytechnique
- ❖ Reactive gases and aerosol measurements performed at LSCE

SIRTA Station

Trace gas and aerosol measurements within ACTRIS



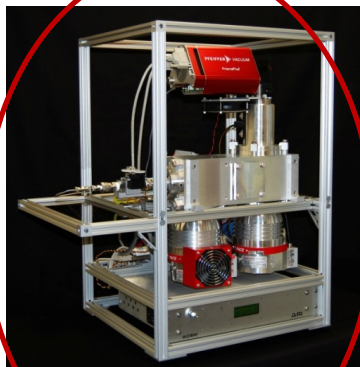
SMPS + OPC



TEOM - FDMS EC-OC Sunset Field Inst. + PILS-IC



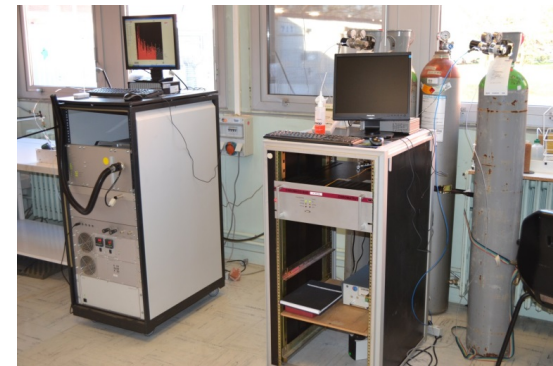
Nephelometers + Aethalometers



ACSM



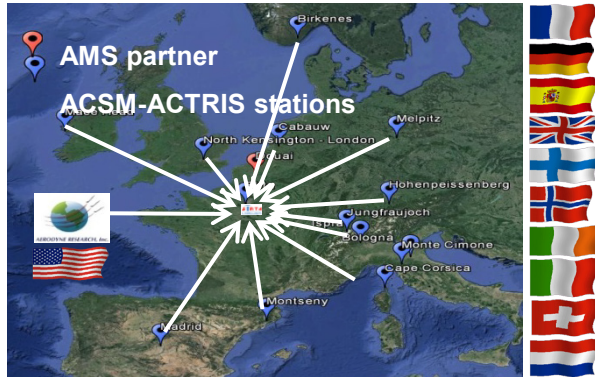
Filter chemistry NO, NO₂, O₃



VOC: PTR-MS & GC-FID (routine off-line measurements)

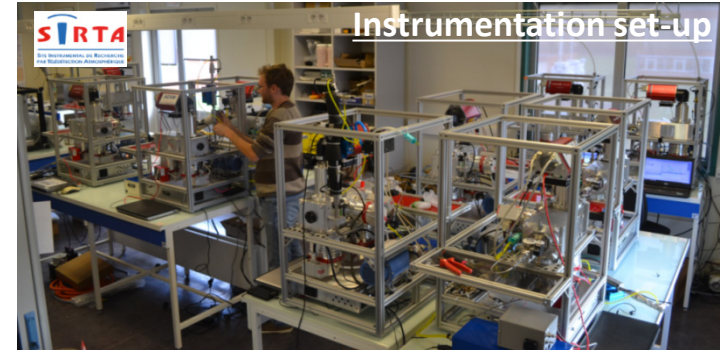
1st ACSM intercomparison during ACTRIS-1

First European ACTRIS-ACSM intercomparison study (Nov. 2013)



10 European countries
participating

15 aerosol mass spect.
intercompared



ACSM intercomparisons during ACTRIS-2 will take place at SIRTA/LSCE, at the «Aerosol Chemical Monitoring Calibration Center »

Aerosol Chemical Monitor Calibration Centre (ACMCC)

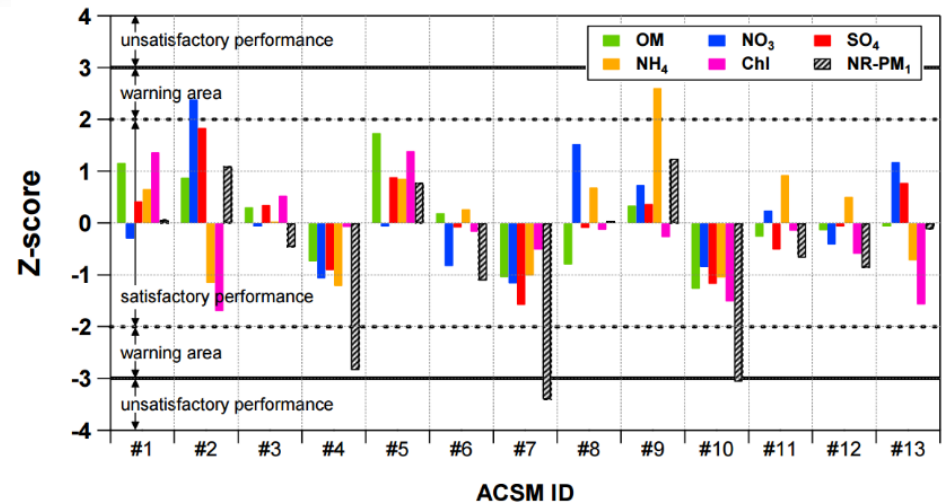
WHERE ? At the SIRTAL/LSCE site

WHAT ? Calibration facility for on-line *in-situ* chemical analyzers (ACSM ...)
Intercomparison studies, training, exchange of knowledge, best-practice...

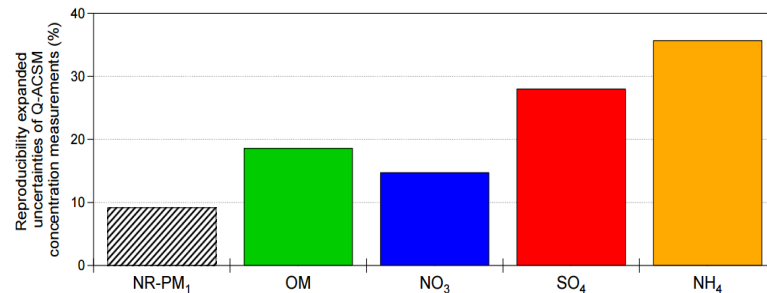
WHO ?



1st intercomparison exercise (ACTRIS 1, Nov-Dec. 2013)

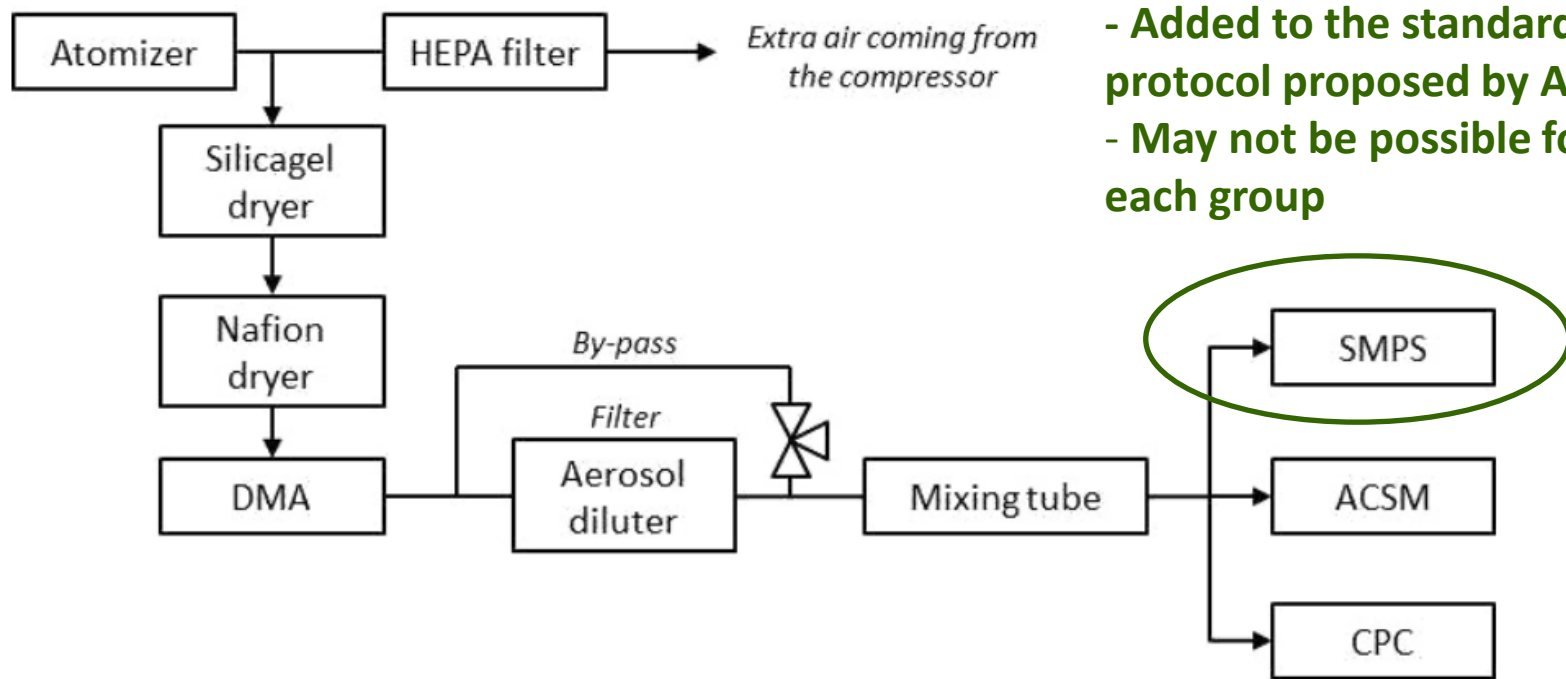


- 2 publications: Frohlich et al., 2015, Crenn et al., 2015
- Good agreement between 15 mass spectrometry instruments (including 13 ACSM).
- Identifying instrument uncertainties.



- Improved Aerodynes calibration with second SMPS.

ACMCC calibration setup



- Added to the standard protocol proposed by ARI
- May not be possible for each group

Crenn et al., 2015

Still need to be optimized (e.g., including a CPMA)

1st intercomparison exercise (ACTRIS 1)

What was learned?

- Significant discrepancies in some of the ACSM organic signals were identified. Uncertainties of how organic signal varies within inorganic mixtures.
- Calibration of SO₄ needs to be improved.
- No pre-calibration acquisition was performed.
 - Not able to address instrument performance prior to calibrations

ACTRIS 2: WP8 ACMCC intercomparison exercise

acmcc@lsce.ipsl.fr

2 intercomparisons planned within ACTRIS 2:

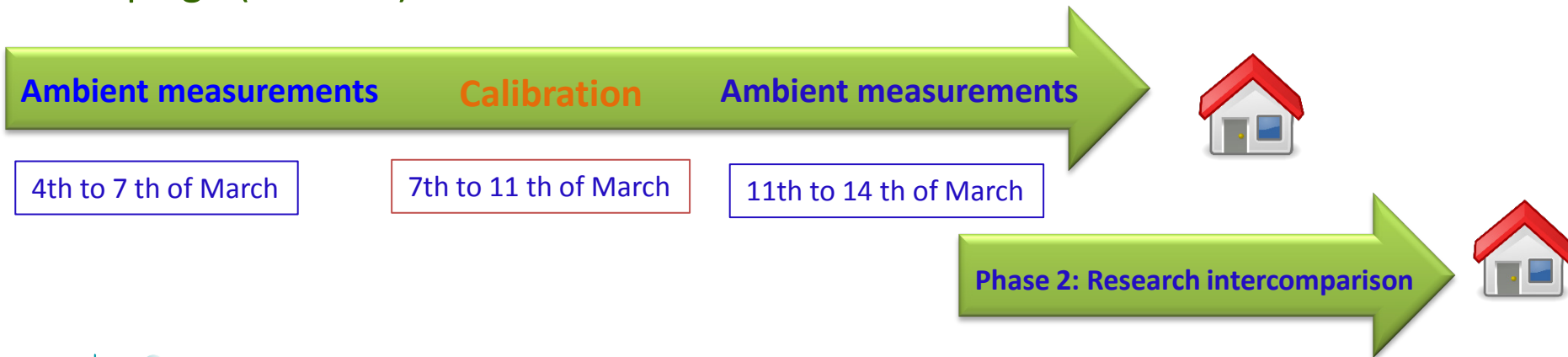
- 1ST - March 2016
- 2nd - Dates to be confirmed.

March 2016, 2 phases:

Recommended, WP8: Calibration campaign/intercomparison

(1st two weeks of March)

Optional, WP3: ToF-ACSM instrument intercomparison and research field campaign (3 weeks)



ACTRIS 2: WP8 ACMCC intercomparison exercise

Planned improvements:

- CPMA – Centrifugal Particle Mass Analyser
 - Accurate mass analysis → used after DMA to select particles in calibration set up.
- Pre-calibration acquisition: 3 to 4 days

- Improvement of calibration protocols for SO₄
- Development of calibration protocols for organic standards

- Develop pre-/post-calibration evaluation protocols



ACMCC Report for each instrument:

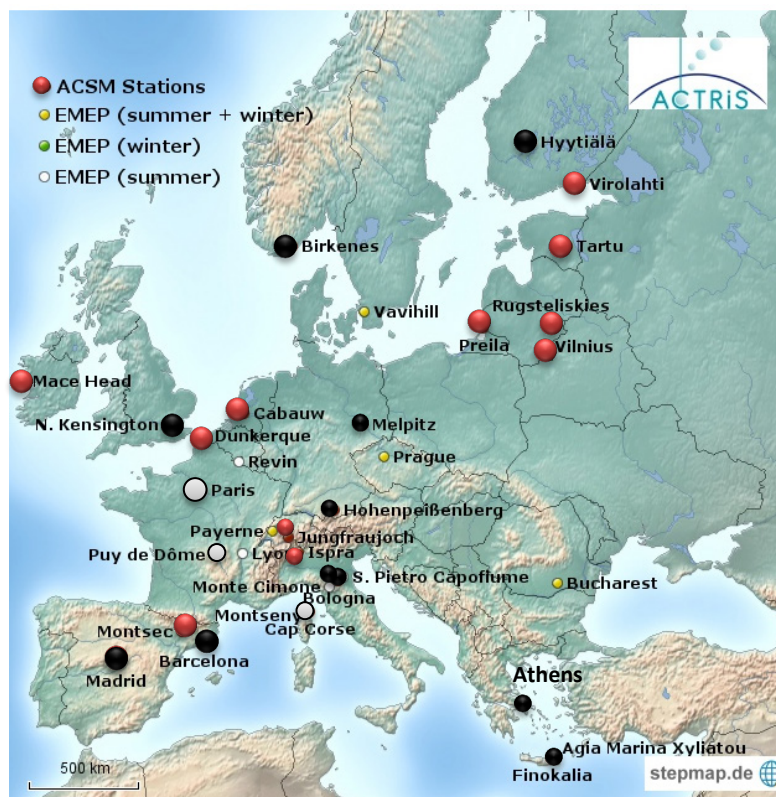
- Whether instrument passed/or not
- Recommendations for each site.

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ACTRIS 2: WP8 ACMCC intercomparison exercise

March 2016: ACMCC intercomparison

1st Phase (WP 8)



11 TNA ACMCC Applications received

+

3 French ACSM instruments (not eligible for TNA)

1 HR-ToF-AMS (reference)

2 Others (PILS/SUNSET) (reference)

Applications closed 15th of November

Decisions made by 15th of December

Final list of participants to be known by Jan, 15th



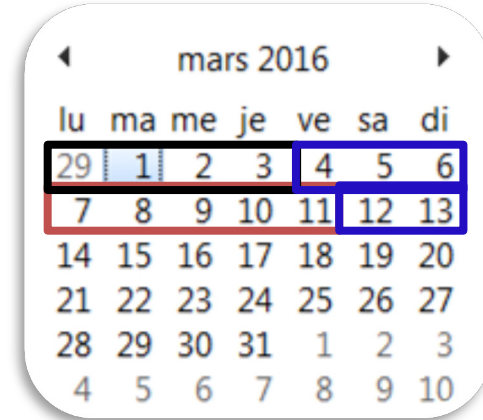
Instrument should arrive at the latest the 2nd of March (Preferrably the 29th February) → Each instrument should be updated with latest DAQ.

→ **Precalibration acquisition**

Users + Aerodyne arrive on Monday 7th.

- ACTRIS reporting (Instrument evaluation/User evaluation).
- workshop with « Aerodyne » to perform data analysis

- **Calibrations: IENO₃, IESO₄, Organic standards.**
- **Develop calibration methods for the organic aerosol.**
- **Instrument reactions to mixed solutions (Organic/inorganic)**



→ **Post-calibration acquisition**

Instrument packed up and shipped back to user



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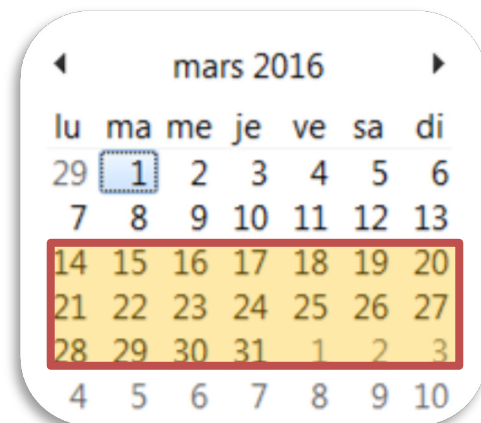
ACTRIS 2: WP3 ACMCC intercomparison exercise

2nd Phase: Research activities (WP 3)

Long-term ambient sampling focused on ACSM –ToF instrument.

Improve organic signal quantification

Intercomparison and source apportionment study.



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