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

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

SIRTA Station

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

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

WHAT? Calibration facility for on-line *in-situ* chemical analyzers (ACSM ...)

**Intercomparison studies**, training, exchange of knowledge, best-practice...

WHO?

ACMCC
aamcc@lsce.ipsl.fr
Evelyn Freney
Olivier Favez
Valérie Gros

Jean Sciare
Cyl

Local / Technical support (LSCE)
François TRUONG

Local / Technical support (INERIS)
Tanguy AMODEO
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

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

Crenn et al., 2015
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 SO$_4$ needs to be improved.

- No pre-calibration acquisition was performed.
  - Not able to address instrument performance prior to calibrations
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)

Ambient measurements, Calibration, Ambient measurements

| 4th to 7th of March | 7th to 11th of March | 11th to 14th of March |

Phase 2: Research intercomparison
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
ACMCC: Aerosol Chemical Monitor Calibration Centre: A new facility for the quality control of ACTRIS-2 Aerosol Chemical Speciation Monitor (ACSM) measurements

Instrument should arrive at the latest the 2nd of March (Preferably 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: IENO$_3$, IESO$_4$, **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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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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