

ACMCC (Aerosol Chemical Monitor Calibration Centre): An overview of the recent ACTRIS intercomparison exercise.

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The Aerosol chemical speciation monitor (ACSM), developed by Aerodyne, is an instrument designed for long-term monitoring of submicron non refractory aerosol particles, including organic, nitrate, sulphate, and chloride species. Over the past five years, these instruments have been installed at a large number of world class atmospheric observing stations around Europe. These ACSM measurements are now included in the European research infrastructure for aerosol, clouds, and trace gases (ACTRIS 2, <http://www.actris.eu>). This infrastructure serves a vast community, working on models and forecast systems, by offering high quality data for atmospheric aerosols, clouds, and trace gases. The chemical and physical properties of aerosol particles and trace gas species as well as their vertical profiles are measured across a number of work packages (WP).

The large spatial extent of this network requires that operating procedures are put in place to ensure that measurements are performed in the same way with the same level of quality assurance. In France, an Aerosol Chemical Monitor Calibration Centre (ACMCC) has been established within the framework of ACTRIS and collaborates with the already existing European Centre for Aerosol Calibration (ECAC). This center is located at Gif-sur-Yvette (France), South-West of Paris. It is managed by a consortium of French laboratories: CNRS (LSCE and LaMP), CEA, and INERIS. The ACMCC facility is open to the entire scientific community and air quality networks.

In March 2016, a total of 15 Q-ACSM instruments and 5 ToF-ACSM instruments were compared. This was the second intercomparison for the Q-ACSM instruments and the first time for the newer ToF-ACSM instrument. The objective of this intercomparison exercise was to first ensure that all ACSM instruments operating within ACTRIS2 were calibrated using a homogeneous and improved calibration procedure at least once during the ACTRIS2 operating period (2015 to 2019). However, in addition to this, the ACMCC takes advantage of having a large number of instruments grouped together to improve our knowledge of how the ACSM instrument responds to different organic and inorganic compounds. This was assessed using a photochemical simulation chamber (PAM, Aerodyne) to generate organic aerosols with a range of photochemical ages. Finally, this intercomparison exercise also provided a good opportunity to compare a small group of the newer ToF-ACSM instruments over a period of three weeks. In this presentation, we present the first results of the intercomparison exercise.