



CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS



**UNIVERSITY OF
BIRMINGHAM**

JOINT ACTIVITIES:

Intercomparison of impactors for ultrafine particle sampling

Numerous online instruments are currently available for ultrafine particle monitoring in indoor and outdoor air. These instruments address different properties of particles, i.e. particle number, mean size, size distribution, surface area, etc. The number and type of instruments available for sampling particles in this way is, by comparison, relatively limited. In this framework, for this joint activity the CSIC, ICPF and University of Birmingham HEXACOMM teams proposed to assess the performance of low-pressure cascade impactors. The purpose of this activity was two-fold:

- 1) to intercompare the performance of particle impactors with regard to the particle mass size distribution, and
- 2) to collect representative ultrafine particle samples (<100 nm) in order to chemically characterise these particles.

To this end, three subsequent sampling campaigns were planned: in Prague during the winter months (February 2015), in Barcelona during summer (June 2015), and in Birmingham in autumn (probably October 2015). The ESRs 12, 10 and 5 (based in Barcelona, Prague and Birmingham, respectively) were directly responsible for the field work as well as for the data processing. ER 2 (based in Prague) was also involved in the field work.

The instrumentation employed was provided by the three collaborating teams (Figure 1, corresponding to the Prague winter campaign):

- Impactors: 1 BLPI (ICPF) + 1 SDI (ICPF) + 1 Nano-BLPI (CSIC) + 1 NanoMOUDI (UB)
- SMPS/APS – sampling in parallel, one sample every 5 min
- AMS – synchronous sampling with SMPS
- HTDMPS – synchronous sampling with SMPS, RH dry < 25%, RH wet = 90%
- NSAM – synchronous sampling with SMPS.

The aim of the work was to characterise ultrafine particles and particle size distributions in indoor and outdoor air. However, sampling indoors was not possible in Barcelona due to the absence of the appropriate facilities, and therefore the experiments focused only on outdoor air. This issue will also be addressed in the Birmingham campaign.

Whereas the number of online particle instruments used varied in the different campaigns, the three impactors were consistently deployed in all locations (Prague and Barcelona) and will also be deployed in Birmingham. The results from this collaborative work are expected to be presented in at least 2 scientific publications in peer-reviewed journals.

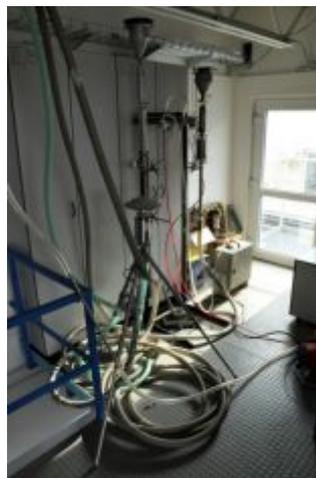


Figure 1