

The REDMAAS 2012 SMPS+UFP intercomparison campaign

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The Spanish network on environmental DMAs (Red Española de DMAs Ambientales, REDMAAS) is currently formed by six groups involved in the measurement of atmospheric particle size distributions by means of Differential Mobility Analyzers (DMAs). These groups are: IUMA-UDC, IDAEA-CSIC, INTA, IARC-AEMET, University of Granada and CIEMAT. The network has been working during 2010-2012 (Gómez-Moreno et al., 2011 & 2012). One of the main activities developed in the network is an annual SMPS and UFP intercomparison. In this work we show the results obtained in the last intercomparison campaign: the DMA calibrations with latex, the CPC intercomparison, the SMPS+UFP results and additionally a study on particle deposition on dryers. This last study tried to take into account the particle deposition in the sampling lines, especially in the dryer section because of the few results published. The DMA calibration showed very good results, with all the instruments having a smaller deviation than 3% for 80 nm latex particles. The CPC intercomparison showed two groups of instruments measuring the same concentrations but with a 10% of deviation between the two groups. Six dryers (5 Permapure Nafion dryers SS12" and 1 dryer SS24") were tested in the deposition study. The results showed differences in their individual behaviours, a possible age effect could be seen although other reasons cannot be excluded, i.e. the inner tube could be twisted. A comparison with theoretical deposition has been done. To calculate diffusional particle losses in the dryers, Wiedensohler et al (2012) recommended to consider the Permapure Nafion dryers SS12" and SS24" as equivalent pipe lengths of 1.25 and 2.5 m respectively. These same equivalent lengths have been used to consider other different mechanisms for deposition.

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Gómez-Moreno et al. (2011) European Aerosol Conference, 4P291, Manchester.

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Wiedensohler et al. (2012) Atmos. Meas. Tech., 5, 657-685.