PART’AERA: Comparison of PM10 emission sources and measurement methods on both sides of the Alps

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Every winter the alpine region suffers pollution episodes due to emissions of particulate matter and its precursors, propagated by meteorology and topography unfavorable to dispersion.

As a result every year, both France and Italy recorded violations of the limits of European law for different pollutants.

PART’AERA is a European project, funded by EFRD, realized in the ALCOTRA zone from January 2013 to march 2015 with a partnership of 4 different subjects: Arpa Piemonte and Liguria Region in Italy, Air Rhône-Alpes and Air PACA (Provence Alpes-Côte d’Azur) in France.

Aim of the project is to harmonize knowledge on measurement methods on both sides of the Alps and to evaluate the emission sources of atmospheric particulate matters (PM).

A PM10 ANNUAL SAMPLING CAMPAIGN was carried out from July 2013 to July 2014 with gravimetric and automatic instruments, in all four Part’Aera sites, both rural and urban.

PM mass balance on annual concentration shows that most species identified are: organic matter, crustal matter, sulfates and nitrates which constitute from 63% up to 87% of particulate matter.

An annual campaign to carry out in-depth CHEMICAL SPECIATION was also performed with high volume PM10 Digital DAB08 sampler (120 sampling days).

All analyses were performed by LGSEE-CNRS and LCME-University of Savoy laboratories, France.

The results were consistent with the data quality objectives of Dir. 2008/50/EC. The standard deviation, between 2.1% and 14.9% (average deviation 8.1%) is related to the use of different operators, modes of transport and laboratories.

A FIELD INTERCOMPARISON of PM10 gravimetric measurement methods was also carried out in Marseilles, inside the park Longchamp, a background site in the city center.

2 types of gravimetric samplers - Partisol PLUS 2025 for French partners and Skypost PM HV for Italian ones - have sampled for 28 days throughout September 2014.

Mass balance analysis have been used to identify and apportion sources of PM, within the PMF SOURCE APPORTIONMENT model.

PMF analysis led to identification of 12 factors for Part’Aera sites. Each factor being a linear combinations of species characteristic of every source.

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