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Chemical composition and source apportionment of PM10 at different Swiss locations 2008/2009 compared to 1998/1999

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During a one year period (from August 2008 to July 2009) PM10 samples from different locations in Switzerland (urban kerbside, urban background, suburban and rural) were collected and analysed for inorganic ions, trace elements and the carbonaceous fraction. The data provide a detailed picture of the variation of the PM10 chemical composition between different site types, regions and seasons.
10 years earlier, from January 1998 to March 1999, a similar study had been performed. As in the recent study, the data provided a detailed picture of the PM10 chemical composition at different Swiss sites (Hueglin et al. 2005) and allowed the identification and characterisation of the main emission sources. We present the PM10 chemical composition obtained in the study of 2008/2009 and we compare the results of this study with the earlier findings. In particular the chemical composition data will be discussed in the light of slightly but steadily decreasing total PM10 concentrations in Switzerland.
As a fundamental part of this work, the data from both studies were analysed (respectively re-analysed) with factor analytical receptor models (Positive Matrix Factorization, PMF). The main PM10 sources and components were identified as: traffic, wood combustion, mineral dust, secondary sulphate, secondary nitrate, and a Na and Mg rich factor. The differences in source characteristics and contributions between the two investigation periods will be presented. First results indicate significant contributions from secondary components and wood combustion at all the sites. Characteristic regional differences, e.g. between the rural sites north and south of the Alps were also identified.

References:
Hueglin, C., R. Gehrig, M. Gysel, U. Baltensperger, C. Monn and H. Vonmont (2005). Chemical characterisa-tion of PM10 and PM2.5 at urban, near-city and rural sites in Switzerland. Atmos. Environ. 39: 637-651.