



Aerosols from wood combustion versus traffic in Alpine valleys (AEROWOOD project)

A.S.H. Prevot (1), J. Sandradewi (1), M.R. Alfarra (1), K. Gäggeler (1), J. Dommen (1), S. Weimer(1,3), C. Mohr (1), M. Furger (1), E. Weingartner (1), S. Szidat(1,2), G. Legreid (3), M. Hill (3), S. Reimann (3), A. Caseiro (4), A. Kasper-Giebl (4), H. Puxbaum (4), A. Veres (5), Z. Bozoki (5), D. Gross (6), U. Baltensperger (1)

Paul Scherrer Institute (andre.prevot@psi.ch/+41 56 3104525)

Within an international collaboration, measurements were performed during two winter field campaigns in the Mesolcina and the Riviera valleys in the Swiss southern Alps in order to quantify the contribution of the wood burning and traffic emissions to the ambient aerosol in those valleys. The core of the instrumentation for this distinction were the Magee wavelength dependent aerosol light absorption (Aethalometer), levoglucosan off-line measurements with an HPLC, an Aerodyne Mass spectrometer, a TSI aerosol time of flight mass spectrometer, and ^{14}C isotope analysis from accelerator mass spectrometry in both the EC and OC fraction. The ^{14}C isotope yields unambiguously the fossil and current carbon in the aerosols, while the other instruments provide tracers or fingerprints and thus quantitative or at least semi-quantitative information on the contribution of the different sources at a high time-resolution. In addition, organic acids in the gas and aerosol phase, trace elements with rotating drum impactor - synchrotron x-ray fluorescence, oxidized and regular volatile organic compounds and standard parameters were measured at fixed sites. The combination of these unique measurements led to the conclusion that organics are strongly dominating the aerosol mass and wood burning is responsible for the major part of the organics, especially during evening hours. In addition, mobile measurements allowed the assessment of the near-ground spatial aerosol distribution. The measured aerosol volume was often highest in the villages, confirming the importance of wood burning. The aerosol numbers however, especially of ultrafine particles, were highest on the highway. A quantification of the contributions of both wood burning and traffic emissions to ambient aerosols will be given at the conference.