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Source apportionment study of submicron organic aerosols

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Source apportionment study was performed for organic PM1 fraction in Roveredo-GR, Switzerland. In this small village 75% of the households uses wood burning for heating purpose, moreover a two-lane trans-Alpine highway passes through it. These characteristics make Roveredo an interesting location for wood burning and traffic emission analysis. Real time measurements of sub micrometer aerosol were performed using an aerosols mass spectrometer (Aerodyne Q-AMS) during two winter periods, March 1-16 2005 and November 24 to December 15 2005. Positive matrix factorization (PMF) and a hybrid receptor model (solved by the ME-2 program) were used to identify the main sources and components of the total organic aerosol and their source activities. Obtained factors (source composition) were compared with reference mass spectra and scores (source activity) were correlated with measured concentration of tracer species in the aerosol and gas phase. Using these methods three main sources and components were identified: wood burning aerosols, oxygenated organic aerosols (mostly representing secondary aerosols) and traffic related hydrocarbon-like organic aerosols.