

Seasonal variation of PM10 source contributions at a rural site in Eastern Austria (Lunz am See)

C. Ramírez-Santa Cruz¹, A.Kasper-Giebl¹, H.Bauer¹, H.Puxbaum¹, W.Wanek², M.Dorningner³

¹Department of Chemical Technologies and Analytics, Vienna University of Technology, Getreidemarkt 9/164AC, A-1040, Vienna, Austria

²Department of Chemical Ecology and Ecosystem Research, University of Vienna, Althanstrasse 14, A-1090, Vienna, Austria

³Department of Meteorology and Geophysics, Althanstrasse 14, A-1090, Vienna, Austria

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Starting in spring 2007 a seasonal cycle of aerosol samples was collected at a rural site in Lower Austria with a Digital High Volume sampler. The sampling site was located at the edge of a small town (Lunz am See, 47° 51' N, 15° 3' O, Elevation: 601 m) with no major emissions sources like industry or busy roads nearby, thus representing a rural background station. PM10 samples were collected on quartz fiber filters. Sampling was carried out on a daily basis. Analyses comprised the determination of water soluble major anions and cations, carbonaceous species (TC – total carbon, EC – elemental carbon, OC – organic carbon and CC – carbonate carbon), anhydrosugars and HULIS. During a limited number of days additional aerosol samples were collected on cellulose acetate filters for the determination of mineral dust and trace metals.

Here the seasonal cycles of the main aerosol components will be shown with focus on their concentration ranges and their behavior against external influences, like temperature or precipitation. Aerosol mass ranged from 8.6 – 23.5 $\mu\text{g}/\text{m}^3$ considering monthly averages and exceeded the 50 $\mu\text{g}/\text{m}^3$ limit given EU-Guideline 1999/30/EG of 1999 only once. The secondary inorganic aerosols represented up to 35 % of the aerosol mass. Organic material rose up to 45% in the late summer. Furthermore a macro tracer model (Puxbaum, 2004) was used for source apportionment. Levoglucosan concentration was used to estimate the contribution of wood smoke to aerosol mass (Schmidl, 2008) as well as organic matter concentrations. Levoglucosan was quantified using anion-exchange high-performance liquid chromatography with pulsed-amperometric

detection (Caseiro, 2007). Biomass burning represented between 2 and 22% of aerosol mass depending on air temperature. Generally the source apportionment varied considerably between different seasons.

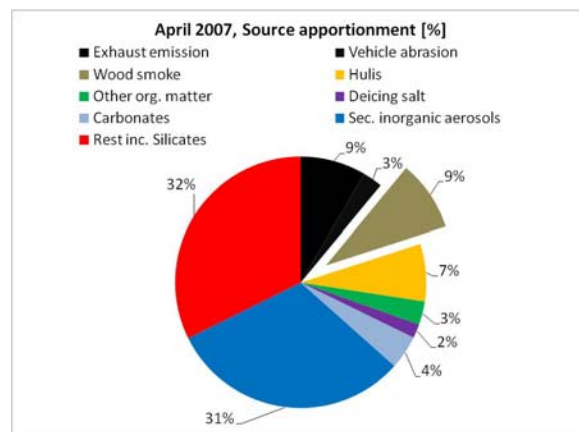


Figure 1: Source apportionment for the month of April 2007, percentage of the total mass.

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