

## SIZE-SEGREGATED PHYSICAL-CHEMICAL CHARACTERIZATION OF PARTICLES IN THE URBAN BACKGROUND OF SAXONIAN LOW LANDS (GERMANY)

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Extensive size-segregated characterization of tropospheric aerosol was performed at the research station of the Leibniz-Institut für Troposphärenforschung (IfT) in Melpitz, an air chemistry and physics station situated in a flat terrain in Central Europe (12°56' E, 51°32' N, 86 m asl.), a measurement site in the air quality network of the UBA and an EMEP level 3 aerosol station. The PM concentration mainly depends on transport from different source regions. Under the dominating wind direction from the Atlantic ocean (70 % of time) maritime air masses (MA) with showers were transported to Melpitz. The second important wind direction is East (20 % of time). Here, during high-pressure conditions continental dry air masses (CA) are transported over long distances with moderate wind velocity. The main sources for CA are Russia, Poland, Belarus, Ukraine, and the North of Czech Republic. In these areas major sources of anthropogenic air pollution (e.g. outdated power and industrial plants, older cars) still exist.

Particles were sampled daily with high volume filter-samplers (for PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>) and during selected days with meteorological well-definite air mass origin with five stage BERNER-Impactors (cut-off sizes 10, 3.5, 1.2, 0.42, 0.14, and 0.05 µm, stages 5 to 1) and analyzed for mass, content of water-soluble ions, organic and black carbon, and selected organic species. The particle number size distribution were measured continuously directly in the range 3 to 800 nm and using a thermodenuder for evaporation of volatile particle mass before measuring the number concentration with DTMPS.

In winter the PM concentration is higher as in summer and for MA the concentration is lower as for CA. The PM<sub>2.5</sub>/(PM<sub>10</sub>-PM<sub>2.5</sub>) ratio increased from summer 2004 (MA 1.9, CA 2.7) to winter 2004/05 (MA 6.2, CA 4.9). During summer more coarse particles exist from local sources. The (PM<sub>10</sub>-PM<sub>2.5</sub>) mass decreases in winter complimentary and particles < PM<sub>2.5</sub> from long range transport dominate the PM<sub>10</sub> particle mass. These particles were detected at stages 2 to 4 of the BERNER-Impactor with the highest mass concentration in CA.

Daily mean particle mass concentrations PM<sub>10</sub> can reach levels near 50 µg/m<sup>3</sup> and at some days in winter also above depending of season and air mass origin for the urban background. This is already the limiting value for urban areas in the EU and can be exceeded only 35 times a year. Major cities can not fulfil this limit at traffic road sites, especially.