

Size dependent particle concentration and deposition measurements with filterpacks – a five year study in Germany

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For five years (1995 to 1999) weekly filter pack samples (PM 10, PM 2.5 and additional in 1999 also two packs for PM1) were collected by a virtual impactor using Teflon-filters for the determination of ion concentration (analyzed by ion chromatography) and especially in 1999 quartz-filters for the characterization of the carbon fraction (analyzed by thermographic technique using a Ströhlein carbon analyzer). The samples were taken with the “Partisol 2000“ Air Sampler (Rupprecht and Patashnik Co. Inc., Albany, New York, USA) at the IfT-research station Melpitz (Altitude 87 m, Latitude 51°32' N, Longitude 12°54' E) in the downstream plume of the Leipzig conurbation. The sampling schedule started every Tuesday at 12:00 CET.

The aerosol mass and ion concentration show different distribution in the size fractions over the year. The maxima for the mass ratios (PM10 – PM 2.5)/PM2.5 were observed in summer indicating more coarse material with higher aerodynamic diameter during relatively dry periods. Using a simple model and results from micrometeorological measurements the proportion of the ions containing in PM 2.5 and PM 10 at the total deposition is estimated for Melpitz (1995, 1996 and 1997) and compared to two other sites in Europe.

For 1999 the composition of carbonaceous material in the PM 1 fraction is discussed.