One year analysis of sedimentation samples at Évora, Portugal

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Data and Methods

Aerosol particles were investigated at the Geophysics Center of Evora (CGE, 38.57°N, 7.91°W, 290 m a.s.l.) for more than 1 year. The sampling period was usually 1 week. The particulate matter was collected on Aluminium stubs coated with carbon adhesives inserted into a modified version of the aerosol passive sampler Type A "flat plates" by Ott and Peters (2008).

The elemental analysis was done using an HITACHI VP-SEM interfaced with a Bruker EDS QUANTAX automatic ESPRIT software as well as FEI QUANTA 200 FEG. The conditions for SEM were as follows: 20 kV accelerating voltage; 10 mm working distance; 120 mA emission current; 70 mA probe current.

About 1000 particles were analysed for each sample and particle size and elemental composition was determined. Based on a set of rules the elemental composition of each particle was transformed into 8 chemical classes. Additional the particles were separated into 3 classes according to their size.

Trajectories were calculated with the HYSPLIT model (Draxler and Hess, 1998) in order to support the interpretation of the data. 10 days backward trajectories were calculated between 500 m a.s.l. and the top of the boundary layer, with a vertical spacing of 100 m and for every hour. Subsequently the location of the points along the trajectory path which are inside the boundary layer were determined and a source region (e.g. Africa, Europa, Atlantic Ocean) was assigned.

Results

Figure one shows the time series of the 8 chemical classes for the largest sampled particles (2.5 – 10 µm). Over the whole period silicates were predominant with an abundance of about 50%. Sulfates vary over time between almost 0% and 30%.

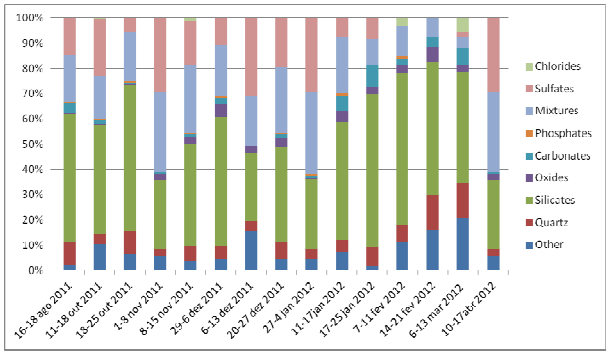

Figure 1. Time series for the chemical composition of deposited particles with diameters between 2.5 and 10 µm.

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References

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