GROUND-BASED CHARACTERISATION OF AEROSOL CHEMICAL COMPOSITION DURING THE SALTRACE CAMPAIGN

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Aerosol chemical composition was investigated during the Saharan Aerosol Long-range Transport and Aerosol Cloud Interaction Experiment (SALTRACE) which was conducted to investigate the transport of mineral dust and the effect of aerosol cloud interactions. Aerosol particles were collected at two stations separated by about 4000 km namely at the Cape Verde Atmospheric Observatory (CVAO) and at Ragged Point on the east coast of Barbados, respectively, to further investigate the changes in the aerosol chemical composition during the dust transport. Both size resolved (using a 5-stage Berner impactor) and bulk (using a high volume DIGITEL DHA-80 sampler) aerosol samples were collected at both stations in a 24 h sampling routine for a period of about 4 weeks. The filters were analyzed for inorganic ions, soluble and non-soluble trace metals as well as organic and elemental carbon (OC/EC).

Our observations show that despite the long range transport, the aerosol composition was dominated by mineral dust and sea salt which were mainly found in the coarse mode aerosol fraction at both stations. The aerosol mass did not show strong variation between the two stations with average mass concentrations of 23.58 ± 9.1 µg/m³ and 28.04 ± 11.1 µg/m³ at CVAO and Ragged Point, respectively. Higher dust concentrations and aerosol pH were observed at Ragged Point in comparison to CVAO. However, lower concentrations of sulfates, nitrates as well as organic matter were observed at Ragged Point in comparison to CVAO. These differences are related to differences in the air mass history at both stations with stronger continental European air mass influence at CVAO as compared to Ragged Point. Aerosol iron solubility did not show any strong increase due to the long range transport.

Aerosol chemical composition of Asian dust at Takijistan

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Asian Dust is often understood as large amounts of lofted mineral dust above Asia. But its sources and sinks are not necessarily only in Asia: the dust may also be advected from far away sources like the Saharan desert. Hence, Asian dust is more than a regional phenomenon. After the dust is lofted into

the atmosphere, it will be transported and mixed with other atmospheric particle types. Its optical and chemical properties may be changed by aging on its way through the atmosphere. Asian Dust affects not only the atmospheric radiation budget, but also human health, and even economics. Thus, the Asian Dust needs a multiple-dimensional approach into several directions and scientists of different disciplines are working on this phenomenon.

The chemical composition of Asian dust at Suchanbe (Takijistan) was characterized during the CADEX (Central Asian Dust EXperiment). Aerosol samples were collected using a high volume DIGITEL DHA-80 sampler on quarz fiber filters