Geophysical Research Abstracts
Vol. 15, EGU2013-12072, 2013
EGU General Assembly 2013

Elemental characterization of Aeolian aerosol from Cape Verde by INAA and PIXE

Marina Almeida-Silva (1), Susana Marta Almeida (1), Miguel Reis (1), Paula Cristina Chaves (1), Ana Taborda (1), Maria do Carmo Freitas (1), Casimiro Adriano Pio (2), Teresa Nunes (2), João Cardoso (2,3)

(1) IST/ITN, Sacavém, Portugal (marina@ctn.ist.utl.pt), (2) Aveiro University, CESAM, P-3810193 Aveiro, Portugal;, (3) Cape Verde University, Campus do Palmarejo, Praia, Cape Verde

Sahara Desert is the most important source of mineral dust, contributing more than 1900 million tons per year and responsible for almost half of all the Aeolian material provided to the world's oceans. This study was carried out in Santiago's island, the largest island of Cape Verde Archipelago because its localization is directly on the route of Saharan dust transport to the Atlantic Ocean, thus an ideal place to quantify and characterize the African aeolian aerosol. The objective of this study was to (1) conduct an elemental characterization of airborne particles sampled in Cape Verde and (2) assess the influence of Sahara desert on local suspended particles by using the Hysplit model and ratios between elements. Particulate matter (PM_{10}) was collected in Praia city (14º94'N; 23º49'W) with a low volume sampler in order to characterize its element composition by k0-INAA and PIXE. Results showed that PM_{10} concentrations in Cape Verde markedly exceeded the health-based air quality standards defined by EU, WHO and EPA in part due to the influence of Sahara dust transport. The PM_{10} composition was characterized essentially by high concentrations of elements originating from the soil (Ca, Fe and Si) and sea (Cl and Na); and low concentrations of anthropogenic elements (As, Ni, V, Sb and Zn). The analysis of backward trajectories and cluster analysis showed that Saharan transport events resulted in significantly higher concentrations of mineral aerosol, due to 39% of all backward trajectories come from African.