Geophysical Research Abstracts
Vol. 15, EGU2013-12209, 2013
EGU General Assembly 2013

Source Apportionment of Particulate Matter Sampled in Cape Verde

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Due to its geographical position, Cape Verde is highly affected by the transport of dust from the Sahara desert. Consequently, very high concentrations of particles are registered in this archipelago, being essential to elucidate the role that Saharan dust may play in the degradation of Cape Verde air quality, human health, wellbeing, visibility, tourism and economy.
The objective of this study was to identify the main sources and origins of particles sampled in Cape Verde. PM10 was sampled during 2011 and chemical characterization of particles was performed by Neutron Activation Analysis and Particle Induced X-ray Emission for elemental measurements, by Ion Chromatography for the determination of water soluble ions and by a Thermal-optical system for the measurement of carbonaceous aerosol. Source apportionment was performed by integrating Positive Matrix Factorization and Backward Trajectory Analysis. Results showed that in average 68% of the PM10 mass in Cape Verde had a natural origin, being 48% associated with the soil and 20% associated with the sea. During the transport of dust from the Sahara desert the contribution of mineral aerosol increased significantly (69% during periods affected by trajectories provided from Sahara desert versus 13% during periods affected by local sources).