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## Interpretation of Long Term Aerosol and Precipitation Data Generated for Eastern Mediterranean Atmosphere in terms of Acidic Parameters

FATMA ÖZTÜRK, Ali Ihsan Ilhan, Tülay Balta, Gürdal Tuncel

Abant Izzet Baysal University (AIBU)

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### Abstract

Sulfate and nitrate are the well known species determining the acidity of particulate matter and precipitation. Acidic deposition both in dry and wet scheme have detrimental impacts on soil, vegetation, aquatic environment, infrastructure and human health. European governments put significant efforts to reduce sulfur dioxide emissions since 1970s, which results in the significant reductions of sulfate concentrations in wet and dry deposition samples collected in particularly in western Europe. In contrast to this, elevated sulfate concentrations was reported in the eastern part of the Mediterranean region. In an attempt to find the anomalously high sulfate concentrations observed in the Eastern Mediterranean atmosphere, PM<sub>10</sub> aerosol samples were collected in a station located at Turkish Mediterranean coast between 1993 and 2001. Collected samples were analyzed by ion chromatography (IC) in terms of major ions and energy dispersive x-ray fluorescence (EDXRF) for metals including sulfur. Dry and wet deposition samples were collected in a station operated by Turkish State Meteorological Service in the same city between 2005 and 2011. IC was employed to find out the major ion content of the wet and dry deposition samples. Atomic absorption spectrometry (AAS) was used to find the metal content of deposition samples. HYSPLIT backward trajectories were utilized in the cluster analysis to find the main sectors affecting the chemical composition of the aerosol and precipitation samples. Results of the cluster analysis show that trajectory cluster encompassing the western part of the Turkey, Greece and some Eastern European countries have higher sulfate concentrations. Applied Seasonal-Kendall test to find the long term variations in the sulfate and nitrate concentrations of PM<sub>10</sub> samples showed neither increasing or decreasing trend.

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