Geophysical Research Abstracts
Vol. 16, EGU2014-15008, 2014
EGU General Assembly 2014


# Precipitation effects on aerosol concentration in the background EMEP station of Zarra (Valencia), Spain

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Aerosols and precipitation are closely related, presenting a bidirectional influence and constituting an important source of uncertainties on climate change studies. However, they are usually studied independently and in general are only linked to one another for the development or validation of cloud models.
The primary and secondary pollutants may be removed by wet and dry deposition. Wet deposition, including in-cloud and below-cloud scavenging processes, can efficiently remove atmospheric aerosols and it is considered a critical process for determining aerosol concentrations in the atmosphere.
In this study, aerosols and precipitation data from a background Spanish EMEP (Cooperative Programme for the Monitoring and Evaluation of Long Range Transmission of Air Pollutants in Europe) station located in Zarra, Valencia (Spain) were analyzed (1° 06' W and 39° 05' N, 885 m asl). The effect of precipitation on aerosol concentration was studied and the correlation between the intensity of precipitation and scavenging effect was investigated. In order to evaluate the effects of precipitation on different aerosol size ranges three different aerosol fractions were studied: PM10, PM10-2.5 and PM2.5.
In order to eliminate the influence of the air mass changes, only the days in which the air mass of the precipitation day and the previous day had the same origin were considered. Thus, from a total of 3586 rainy days registered from March 2001 to December 2010, 34 precipitation days satisfied this condition and were analyzed. During the period of study, daily precipitation ranged between 0.2 and 28.8 mm, with a mean value of 4 mm.
Regarding the origin of the air masses, those from west were dominant at the three height levels investigated (500, 1500 and 3000 m). In order to obtain additional information, aerosol and precipitation chemical composition were also studied in relation to the days of precipitation and the previous days. Furthermore, in order to identify the type of weather associated with each particular synoptic situation, a Circulation Weather Type (CWT) classification was applied.

Acknowledgment: This work has been funded by the Spanish Ministry of Science and Innovation (Grant TEC2010-19241-C02-01). S. Fernández-González acknowledges the grant from the "Programa de Formación de Profesorado Universitario (FPU)" awarded by the Spanish Ministry of Education.