Geophysical Research Abstracts
Vol. 16, EGU2014-14518, 2014
EGU General Assembly 2014

Assimilation of satellite Aerosol Optical Depth measurements in the CTM MOCAGE during the ChArMEx campaign

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Aerosols are of great importance for atmospheric chemistry, climate, and public health. Consequently, it is important to well simulate the spatial and temporal aerosol distribution. The atmospheric aerosols are a chemically and physically complex mixture of solid and liquid particles from natural and anthropogenic sources. Thus, modelling of different types of aerosols is subject of many uncertainties related to their parameterizations or sources/sinks.
This contribution deals with the improvement of the spatial and temporal representation of different types of aerosols within the chemistry-transport model of Météo-France, MOCAGE. This consists of assimilating Aerosol Optical Depth (AOD) from satellite observations.
The used approach during AOD assimilation consists in choosing the total aerosol concentrations as the control variable. First, we will present the methodology and the advantages of such an approach. Second, we will evaluate the AOD analyses by comparison to the independent aerosol measurements performed during the ChArMEx campaign (summer 2013). ChArMEx is a French initiative which aimed to characterize the atmospheric pollution in the western-Mediterranean basin using airborne measurements from balloons and aircrafts as well as ground-based measurements.