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Dust Model Intercomparison For Summer 2012 In The Western Mediterranean and Comparison to The Pre-ChArMEx/TRAQA Campaign Observations

Sara Basart and the Charmex Team

Barcelona Supercomputing Center, Earth Science, Barcelona, Spain (sara.basart@bsc.es)

Saharan dust is an important contributor on European air quality levels and consequently has a relevant impact on human health and ecosystems. Even though most of the transport of dust particles occurs in altitude, as shown by surface lidars and airborne data, dust events signi?cantly impact surface PM10 concentrations even in urban traf?c type of air quality monitoring stations, and background stations are needed to assess the contribution of desert dust. In this sense, regional air quality models are useful to understand the dynamics and transport of pollutants.

The present contribution shows a preliminary intercomparison of a set of 7 regional dust model simulations (NMMB/BSC-Dust, ALADIN, Meso-NH, RegCM, CHIMERE, COSMO/MUSCAT; MOCAGE and BSC-DREAM8b). The present analysis focuses on the model capability to properly simulate long-range Saharan dust transport for summer 2012 in the Western Mediterranean. In this period, Saharan dust events were numerous as shown by satellite and ground-based observations.

The model evaluation is crucial to determine the individual performance of each model and it provides a useful tool to identify their strengths and weaknesses. In this study, the model outputs are compared against a variety of both ground-based and airborne in situ and remote sensing measurements performed during the pre-ChArMEx/TRAQA ?eld campaign which included the airborne lidar LNG and the new balloonborne optical particle counter LOAC. Also, the models are compared with satellite aerosol products (including MSG/SEVIRI, POLDER and CALIOP) which provide a description of the spatial AOD distribution over the basin. These observational datasets provide a complete set of unusual quantitative constraints for model simulations of this period, combining data on aerosol optical depth, vertical distribution, particle size distribution, and chemical and optical properties.

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