



Sea-salt aerosol forecasting over the Mediterranean Sea

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This study focuses on numerical simulations and forecasting of the sea-salt aerosol (SSA) cycle over the Mediterranean Sea, and on their comparison with ground-based measurements. A sea-salt prediction system was developed on the basis of the DREAM dust aerosol model. The system has been in operational use in Tel-Aviv University since February 2007, producing a daily forecast of 3-D distribution of SSA concentration. To evaluate the sea-salt parameterization, ground-based measurements in the eastern and western parts of the Mediterranean were compared with routine 24-hour model-based forecasts of sea-salt fields, in Tel-Aviv, Israel, March 12 – April 9, 2006, and in Barcelona, Spain, February 2006 – April 2007. Quantitative comparisons show that the sea-salt prediction system produces reasonable forecasts. The increment analysis indicates a dependence of sea-salt concentration increments on relative humidity, which is due to the hygroscopicity of sea-salt particles. We have detected an interference of Saharan dust intrusions into the Barcelona region with SSA forecasts: the presence of dust manifested itself as the model's overestimations of SSA concentrations. Model simulations indicate that under summer light breeze conditions in Tel-Aviv with surface wind speeds less than 4 m/s, the majority of SSA is transported up to 30 km inland from the coastline. With respect to vertical distributions SSA could rise to 300 m. During the transit of cyclones across the Mediterranean, when surface wind speeds exceed 10 m/s, SSA could be present above 1000 m altitude and be transported up to 100 km inland from the coast.