P41 Sensitivity of the meteorological model WRF-ARW to aerosol loading in an arid region.

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Atmospheric aerosols formed from natural and anthropogenic sources act as a cloud condensation nuclei and can affect low cloud/ fog formation and development. They have a direct influence on the life cycle of a fog layer. The knowledge of the effect of the aerosol concentration on the fog forecast is therefore essential. In this perspective, an operational version of the Weather Research and Forecasting (WRF-ARW) model was deployed at Masdar Institute in Abu Dhabi in the United Arab Emirates (UAE) with a focus on arid region-weather processes. Several simulations were conducted with different aerosol concentrations and two moment microphysical schemes, namely, Thompson scheme, Morrison scheme, WDM6. Two domains with one way nesting were defined. The parent domain extends over a large area that covers part of the Arabian Peninsula, the Arabian Gulf and the Sea of Oman at 12 km spatial resolution. A 4 km spatial resolution domain was defined for the nested domain that covers the UAE region (latitude: 20.6N-27.3N, longitude: 50.3E-57.5E). The land use of both domains are classified using the USGS twenty four categories data at 30s spatial resolution. The initial and boundary conditions are drawn from the global operational analysis and forecast products of the National Center for Environmental Prediction (NCEP-GFS) at 0.5o spatial resolution. Five different fog events that occurred on 2014 were considered. Results of the simulation are evaluated using in situ observation of surface meteorological data (METAR) and profile data at different airports in the UAE.