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Study of regional air pollution in Greece including particulate matter.

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The current work is concerned with the application of a 3-dimensional Eulerian model over Greece. The modelling domain covers Greece with a master grid of 10x10 km^2 (110x110 cells) and five vertical layers up to 2.5 km. Nested grids with finer resolution 2x2 km^2 over the capital and the second largest urban agglomeration i.e. Athens and Thessaloniki, provide more detailed pollutant concentrations in the areas which are most densely populated. The chemical transport model used is CAMx (Comprehensive Air Quality Model with Extensions) and the input meteorological data are provided by the meteorological mesoscale model MM5. The emission data used as input to the photochemical model are based on an emission inventory compiled for Greece. Emission data of gaseous pollutants (NMOC, NOx, CO, SO2) and particulate matter (PM10) were estimated for different anthropogenic emission source sectors such as the transport sector, the industrial sector and the central heating sector. The road transport emission inventory was calculated using according to the COPERT methodology and the rest of the transport sector emission inventory was calculated using the methodologies of the EMEP/CORINAIR. Emissions from the Greek national and secondary road network, the Greek urban centers, the off-road vehicles, the railway and the maritime transport were included. In addition, for every month of the year, diurnal biogenic emission variations were calculated. In the current work, results are presented and discussed of a 3-day run during summer 2003. The model results are compared with available measurements from the national monitoring network. The comparison reveals that the model performs reasonably well for gaseous pollutants while there are larger discrepancies for particulate matter. The later is attributed to the larger uncertainties in the estimation of PM10 emissions.