



Cluster analysis of European surface ozone observations and MACC reanalysis data

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Europe has a high density of surface ozone monitoring sites, thus the comparison of measured ozone data with coarse-scale models requires special techniques. We have used Cluster Analysis (CA) to divide stations from the European air quality database (Airbase) into several groups and compare these groups with the results from a similar analysis performed on the output from the MOZART model in the Monitoring Atmospheric Composition and Climate (MACC) project. As initial set of variables the monthly averaged diurnal variations of the individual ozone time series were calculated. CA is an appropriate method for classification of a large number of monitoring sites, in order to find similar ozone behavior and representative station inside each group. Therefore CA opens new possibilities for the comparison between measured and modeled data.

Airbase provides ozone data for all countries from the European Union. After applying filter criteria that 2/3 of data must be present in each month during the period 2007-2010, around 1500 stations were chosen from the Airbase. The modeled data were interpolated to the geographical site locations. Clusters from the measurements were compared with corresponding clusters obtained from the MACC model data.

CA results are shown, characteristics of separate clusters are described, and seasonal-diurnal variations of clusters from monitored and modeled data are compared and discussed.