Assimilation of surface and satellite observations with the Lotos-Euros air quality model and the ensemble Kalman filter technique

H. Eskes (1), L. Curier (2), and A. Segers (2)

(1) KNMI, Climate research, De Bilt, Netherlands (eskes@knmi.nl, +31 30 221 0407), (2) TNO, Netherlands Organisation for Applied Scientific Research, Utrecht, The Netherlands

LOTOS-EUROS is a chemistry transport model developed in the Netherlands, and is used for air quality assessments and forecasts. Operational air quality forecasts for the Netherlands concerning ozone and PM10 are made available on the RIVM webpage (http://www.lml.rivm.nl/) and are used to warn the population in case of predicted exceedances of air quality standards. Lotos-Euros is also contributing to the model-ensemble based air quality forecasts for Europe (MACC project, http://macc-raq.gmes-atmosphere.eu/index.php?op=get). Currently, the system is expanded to assimilate routine observations from European networks for ozone and PM10, as well as OMI NO_2 satellite observations, based on the ensemble Kalman filter technique. This work is done in the context of the MACC project and contributes to the MACC air quality reanalyses for the years 2008 and 2009. The Ozone Monitoring Instrument (OMI) is a Dutch-Finnish instrument on the NASA EOS-Aura mission, and has a capability to detect boundary-layer NO_2 with a unique resolution of about 20 km. In our contribution we will discuss the assimilation of NO_2 tropospheric columns from the OMI instrument, the derivation of emissions and the changes in the emissions and concentrations over Europe for the period 2004-2010.