Geophysical Research Abstracts
Vol. 15, EGU2013-13139, 2013
EGU General Assembly 2013

Evaluation of a new microphysical aerosol module in the ECMWF Integrated Forecasting System

Matthew Woodhouse (1), Graham Mann (1), Ken Carslaw (1), Jean-Jacques Morcrette (2), Michael Schulz (3), Stefan Kinne (4), and Olivier Boucher (5)

(1) University of Leeds, Institute for Climate and Atmospheric Science, School of Earth and Environment, UK, (2) European Centre for Medium-range Weather Forecasting, Reading, UK, (3) Norwegian Meteorological Institute, Oslo, Norway, (4) Max Planck Institute for Meteorology, Hamburg, (5) Laboratoire de Meteorologie Dynamique, Paris, France

The Monitoring Atmospheric Composition and Climate II (MACC-II) project will provide a system for monitoring and predicting atmospheric composition. As part of the first phase of MACC, the GLOMAP-mode microphysical aerosol scheme (Mann et al., 2010, GMD) was incorporated within the ECMWF Integrated Forecasting System (IFS). The two-moment modal GLOMAP-mode scheme includes new particle formation, condensation, coagulation, cloud-processing, and wet and dry deposition. GLOMAP-mode is already incorporated as a module within the TOMCAT chemistry transport model and within the UK Met Office HadGEM3 general circulation model.

The microphysical, process-based GLOMAP-mode scheme allows an improved representation of aerosol size and composition and can simulate aerosol evolution in the troposphere and stratosphere. The new aerosol forecasting and re-analysis system (known as IFS-GLOMAP) will also provide improved boundary conditions for regional air quality forecasts, and will benefit from assimilation of observed aerosol optical depths in near real time.

Presented here is an evaluation of the performance of the IFS-GLOMAP system in comparison to in situ aerosol mass and number measurements, and remotely-sensed aerosol optical depth measurements. Future development will provide a fully-coupled chemistry-aerosol scheme, and the capability to resolve nitrate aerosol.