EMS7/ECAM8 Abstracts,
Vol. 4, EMS2007-A-00639, 2007
7th EMS Annual Meeting / 8th ECAM

Integrated systems of coupled meteorological and chemical transport models: EU practices and improvement strategies

A. Baklanov (1), B. Fay (2)

(1) Danish Meteorological Institute DMI, Denmark, (2) German Weather Service DWD, Germany (alb@dmi.dk / Phone: +45 3915 7441)

A new generation of integrated Meteorology (MetM) and Atmospheric Chemical Transport (CTM) modelling systems for predicting atmospheric composition, meteorology and climate change should combine and integrate (at least) the following factors: air pollution, urban climate/meteorological conditions and population exposure. This combination is reasonable because (a) meteorology is a main source of uncertainty in air pollution and emergency preparedness models, (b) meteorological and pollution components have complex and combined effects on human health, and (c) pollutants, especially aerosols, influence climate forcing and meteorological events.
The improvement and harmonisation of these coupled systems is one of the main aims of the current COST Action 728 'Enhancing mesoscale meteorological modelling capacities for air pollution and dispersion applications' (http://www.cost728.org). A survey of the very many diverse modelling systems in Europe was performed based on COST partner contributions from about 16 European countries and more than 40 institutions. The results of this overview are presented showing the predominance of national weather services or weather forecasting consortia (i.e. COSMO (Lokalmodell), HIRLAM, ALADIN, UM) and of international free community models (i.e. MM5, WRF, MC2, RAMS) for mesoscale MetMs and a larger diversity for CTMs. The wide spectrum of model applications ranges from diagnostic or climatologic AQ assessments, episode analysis and source apportionment to forecasting AQ, urban AQ and radioactivity (and environment) emergencies.
In this context, several levels of integration strategy are considered for off-line and on-line models. The on-line integration of MetM and CTM models allows to con-

sider feedback of e.g. aerosols on meteorological processes and climate forcing. This very promising way for future atmospheric simulation systems has lead to about 10 on-line coupled systems already being used in Europe, including the FUMAPEX and COST728 experience, and will be presented.

The large variety of modelling systems can be considered a scientific asset but creates problems of model result inter-comparison and model development collaboration in Europe. Thus, a COST action seems to be the best approach to integrate, streamline and harmonize national efforts towards model system advances beneficial for a wide community of scientists and users.