

COST728/NETFAM Copenhagen Workshop on Integrated Modelling

DRAFT

Final round table discussion, 23 May 2007

Minutes by Barbara Fay, DWD.

The plenum talk was started by local workshop organiser, Alexander Baklanov, DMI, by first inviting the views of the present extra-European partners on developments, problems and the future of integrated NWP/CTM modelling.

George Grell (NOAA, US) stressed three points for the designation of a new integrated model system. He outlined the importance of dealing with the requirements of the chemical model at the same time as with the meteorological ones. In the past, this was normally neglected and the system designed on meteorological grounds while only adding in the chemistry later. With modern supercomputers, on-line coupled systems are decidedly preferable, guaranteeing high temporal resolution of all coupled processes and feedbacks. There are several advantages of including many models as modules into 1 system framework for maximum information, flexibility and applicability. At the same time, computer resources should allow modellers to be free of needs for parallelisation or other cumbersome technical requirements.

Peter Manings (CSIRO, Australia) outlined the on-line model system approach for the integrated model system provided by CSIRO for all Australian applications. It works well on the smaller scales (1-1000km), e.g. for the import/export of bush or forest fire smoke, while the system is used at the UK Hadley Centre for the larger, global scale.

Masayuki Takigawa (Global Change Research Centre, Kanagawa, Japan) reported on the use of the slightly adapted WRF/Chem model and the special importance of the boundary conditions for NWP and environmental modelling in Japan and the resulting discrepancies. Off-line models used in Japan are mainly US models for chemistry while the meteorological models are provided by the Japanese meteorological agency.

These statements were followed by some announcements by European COST728 partners which moved into a lively discussion about the advantages and applicability of on-line vs. off-line coupled systems and interface matters. **Oswald Knoth (IfU, Leipzig, Germany)** outlined the advantages the time-flexible on-line coupling of the COSMO-EU (formerly Lokalmodell) to the chemistry part. He announced together with **Barbara Fay (DWD, Germany)** that the German Weather Service DWD and the MPI for Meteorology in Hamburg are developing the ICON model as a combined NWP and climate model on a scale-adaptive icosahedral grid including chemistry to become the operational NWP model at the DWD in 2012.

Johannes Flemming (ECMWF) stressed the prime interest in precipitation forecasting at the Centre, and the current introduction of chemistry into the models (in GEMS) in order to build an integrated forecast system. The HIRLAM model now has on-line chemistry features at DMI as outlined by **Alexander Baklanov**. He then mentioned the initial idea in COST728 to build only one integrated model system for Europe. This concept seems politically unviable because of the historically large and diverse modelling efforts currently comprising e.g. 4 NWP Consortia plus ECMWF with their own model developments. Therefore, the aim may be an open system platform for partners to add modules to with harmonised interfaces and

parameters, and especially the improved communication and cooperation between the European partners.

Taking into account the large number of small institutes and administrations across Europe engaged in AQ modelling the need for practical, easy-to-handle solutions on small computers with few staff and restricted modelling experience was emphasised by several partners. These systems are of necessity off-line often using measurement NWP forecasts of ECMWF or national met offices. Therefore, these systems often strongly depend on interfaces connecting the chemistry modules to measurement postprocessing and/or meteorological modules. **Ranjeet Sokhi (Univ. Hertfordshire, UK, COST728 co-ordinator)** referred to 2 presentation slides showing the need for unification of interface modules at least concerning high modularity and I/O format specifications, but possibly also parameterisations, and for according guidelines. ECMWF practice was proposed as a European guideline by Johannes Flemming (ECMWF) who also saw the necessity to test OASIS standards for more of these systems.

Another important topic for the current COST action is the model intercomparison case study initiated for summer 2007 which poses a challenge both on the performance of MetMs and CTMs. It is organised by WG3, **Mikhail Sofiev (FMI, Finland)** who introduced some potential episodes for the case studies, e.g. from the heat wave or East European forest/agricultural fires in 2003 or from the start of summer and fires in 2006 where preliminary tests showed some big misses for the integrated modelling. Study requirements and validation data sets were soon to be provided to the partners in the model comparison study. He also reported about the connected new COST action ES0602 on chemical weather started in spring 2007.

At this stage due to partners' travel requirements, the plenum discussion had to be closed by Alexander Baklanov who shortly summarised the needs for continued COST co-operation in integrated modelling.