

Top Priority Project Report

–Draft–

July 27, 2006

Project:

Assimilation of Satellite Radiances into LM with 1D-Var and Nudging

People: Reinhold Hess/DWD (project leader), Francesca DiGiuseppe/ARPA-SIM, Blazej Krzeminski/IMGW, Christoph Schraff/DWD

General description:

Radiance data from polar orbiting and geostationary satellites (ATOVS, AIRS/IASI, and SEVIRI) are used for LME (and its derivatives) in order to improve forecast quality of LME and also quality of boundary values for subsequent models as LMK. Assimilation of level 1 radiance data is performed in two steps: Firstly, profiles (including screen level and skin values) of temperature and humidity are retrieved from the radiances using a 1D-Var analysis approach. Secondly, these profiles are assimilated with the nudging scheme of the LM similarly to other conventional data.

Activities:

Since the COSMO general meeting in Zurich in 2005 main efforts were technical development and implementation issues according to the priority project plan. The project team had founded a general design of the development that fits all kinds of anticipated satellite radiances. Basically this design has been implemented with negligible changes.

Further items to mention:

- EUMETSAT fellowship

A EUMETSAT fellowship dedicated to the assimilation of AIRS/IASI data into LM was granted for Poland. It was planned that the scientist filling the position will join the project team, however, the position could not have been filled because of lack of suitable candidates. EUMETSAT's policy has been to allow only nationals from member states to apply for a EUMETSAT fellowship. This policy is currently revised so that also people from cooperating states (as Poland) are eligible. The

position will be reopened as soon as possible and it is hoped that under the new EUMETSAT policy more suitable candidates from Poland may apply. Current time planning is to reannounce the position in August 2006.

- Project Meeting

The project meeting took place from 3–7 April 2006 in Bologna at ARPA-SIM where the complete project team met in order to facilitate collaboration in complex and critical areas that are too difficult for email exchange. Discussions included e.g. a design review, related scientific developments of other groups, special issues as debugging test cases and setup of first trial runs (including channel selection, bias correction, etc.) as well as sketching documentation. For the distributed source code development and code sharing a system called Subversion was tested. It simplifies parallel developments in the same file and module. Subversion (svn) is installed at ARPA-SIM and can be accessed meanwhile online by all members of the project.

- Participation of Romania

During the project meeting in Bologna it was agreed that Romania will be given the current developments as soon as they have reached a stable state in order to join the project team. During the SAC meeting in Offenbach in May 2006 however, Romania decided in accordance with the coordinator of WG1 to concentrate on another project (SIR), which has been accepted with great regret.

Progress of Project:

In general the project is well on track when evaluated in terms of milestones and project tasks compared to the project task table. Tasks T1 (a-e) and T2 (a-e) (technical implementation for MSG respectively ATOVS data) have been fulfilled. Because the appointment of the EUMETSAT fellowship is delayed, no work has been done with regards to AIRS and IASI data (i.e. Tasks T3 and T4(c)), however. Task 4 (a-b) is currently in progress but not completed. Trial statistics have already been generated and a continuous monitoring is being worked on. The trial statistics allowed to proceed to Task 5(a-b), where preliminary bias correction have been computed and are currently applied for trial studies and for the continuous monitoring (both for MSG and ATOVS data).