Report on working group "3D real cases"

The working group considered three areas of validation and verification activities:

1. Testing how well a model or scheme is able to cope with a specific meteorological phenomenon. The working group discussed the UM approach to test new model versions against a selection of archetypical test cases, representative for a range of meteorological situations for which it is important that the model performs well. The group agreed on the advantages of using such a comprehensive test set of cases plus associated observations. The test set could include situations such as precipitation over orography, low clouds and fog, winter stable boundary layer conditions, the onset of severe summer convection, and the evolution of anticyclonic situations over the Mediterranean and central Europe. In order to test the model physics rather than the quality data assimilation, the selected cases should be typical rather than extreme, and they should not be highly sensitive towards the initial conditions. Also, in order to focus on mesoscale effects, cases should be preferably selected in which the behaviour of the atmosphere and model on the synoptic scale is accurate and well understood.
2. quasi-continuous or prolonged comparison of models or schemes against special observational locations, where a larger range of observations is available than is usally the case (e.g. detailed surface flux measurements, or more vertical profile information by means of ground-based remote sensing instruments, or networks used in special validation campaigns). These extra observations can be used to test the model or scheme in detail, and may also provide high-quality datasets against which the model climate for e.g. clouds or radiation can be validated. Good examples of such "extended" observational sites are e.g. Lindenberg, Cabauw, Sodankyla, CLOUDNET, and the Helsinki testbed.
3. routine verification and intercomparison of a number of available mesoscale models. This is probably the most rigorous way to test the models under all conditions, but great care has to be taken to define a common model setup in order to make a fair model intercomparison. The participating models should use at least the same initial and boundary conditions, be run on identical grids and resolution, and have the same surface characterization. Met.no presently has experience with running HIRLAM, the UM and MM5. Met.no proposed to set up a suite in which these models and the HIRALD system would be implemented together, using a common model setup for a part of Scandinavia, and to make a comparative verification of the outcome of the four models. The system would initially be set up to run on historical data (several weeks for each season), but could later possibly be used in real-time mode as well.

The following approach is proposed to make progress in these areas:

1. A small working group will be created with the task to select and propose about ten relevant test cases. This group should also come up with a proposal for appropriate diagnostics to be used for each case, and for a carefully controlled setup for running the cases with different models or schemes: area, resolution, initial and boundary conditions and surface forcing. For each test case, the associated observations should be provided. Gwenaelle Hello, Mariska Derkova and Jeanette Onvlee will initiate the formation of the working group. The members are then expected to communicate by email, and present a proposal on the set of test cases, observations, diagnostics and test setup at the joint HIRLAM All Staff Meeting / ALADIN Workshop.
2. It was felt that at present not enough was known about the existing "extended" sites or campaigns planned in the near future. So first a group of people with contacts with these observational communities should find out which data are available and how to obtain access to them; after that, validation exercises can be planned. This could be a task for the working group mentioned under 1., or for selected people (the names of Pier Siebesma and Laura Rontu were suggested).
3. Met.no will come up with a proposal for an intercomparative verification of a suite of 4 mesoscale models by the end of January. This proposal will be communicated to the management of all consortia present at the workshop.