Aladin workshop / Hirlam all staff meeting : common Wednesday discussion on mesoscale data assimilation (Wednesday, May 17th).
(Nils Gustafsson, Claude Fischer)

report from HMG/CSSI (see corresponding powerpoint presentation)

surface assimilation: should there be a particular group on this, or should it be mixed with the prognostic modelling aspects ? for the whole surface issue, HMG/CSSI ask for 2 position papers to be prepared in parallel by the 2 consortia. The papers should describe the strategies, scientific positions and work plans so far. They should also list the cross-consortia interests. HMG/CSSI expect the 2 papers to help finding areas of contradiction. A convergence process should then be proposed. Next "physical rendez-vous": a workshop in Toulouse in December. Group concerned: Hello, Martin, Bouyssel, Tijm, Gollvik, Termonia, Tudor, Geleyn, Kraljevic.

Special question: how to convert observed SST (linked rather to skin brightness temperature) to modelled surface temperature in surface schemes ?

Assimilation of soil moisture ?: complex problem !

4D-VAR issues (addressing first the larger scales): simplified physics; SL TL/AD

physics for TL/AD: 2 approaches possible: either start by differentiating a full non-linear physics package (MF or EC) or start with very simple, restricted set of processes (UKMO). More generally, UKMO have chosen a pragmatic approach, mixing 4D-VAR with some simplified physics with more diagnostic methods (bogusses of various types: clouds, fog… => NIMROD system). For instance, fog can be seen on satellite pictures, but it is difficult to cast this information into a variational or OI analysis.

Focussing on the mesoscale:
One possibility is that mesoscale 4D-VAR may only need the first-order dominating schemes. At Prague WMO symposium (April 2005), 2 US papers showed results on restricted 4D-VAR at high resolution that improved high frequency assimilation and forecast and only had surface fluxes, vertical diffusion and simple microphysics. Maybe even only the adjoint of advection (SL) and diffusion is needed ?

This is not in contradiction with the "old" item of Aladin workplan to have a 4D-VAR in a nutshell (=single outer loop, non-incremental 4D-VAR, with the possibility to analyze high frequency high resolution observations).

Other question is whether inside the assimilation window those processes that are parametrized in the TL physics actually reach equilibrium, which is a pre-requisite since equilibrium states are assumed to cast a diagnostic parametrized equation of a physical process into the TL model. If the processes inside the assimilation window are far from any equilibrium, then maybe a reasonable dynamics/physics balance in the B matrix formulation is sufficient. The problem is then to find such balances (extend the statistical regressions to new meso-gamma scale fields ?).

Last but not least: what about the planning for observations, observation handling (pre-processing, quality control etc.). one has to plan OSE's and OSSE's in order to take profit of any available source of observation, but possibly also in order to convince the deciders (money-providers …) that both the investment in the assimilation system development and in the observational network are worth the effort and the cost.