



HIRLAM-A status and plans

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Outline

- Priorities and deliverables for HIRLAM-A
- Recent results and plans
 - Mesoscale modelling
 - Data assimilation and use of observations
 - Model physics and dynamics
 - Predictability
 - System and applications

Deliverables for HIRLAM-A

- 1) Mesoscale analysis and forecast system
- 2) Continued maintenance and “keeping up to scratch” of synoptic scale system
- 3) Development of operationally feasible and reliable short-range ensemble forecast system

Also:

- Operational implementation of 4D-VAR, assimilation of many new high-resolution RS data
- Later: improved/extended coupling of atmosphere to other systems (hydrosphere, land surface, chemistry)
- Enhanced quality assurance and user-friendliness of Ref.System.
- Enhanced operational cooperation

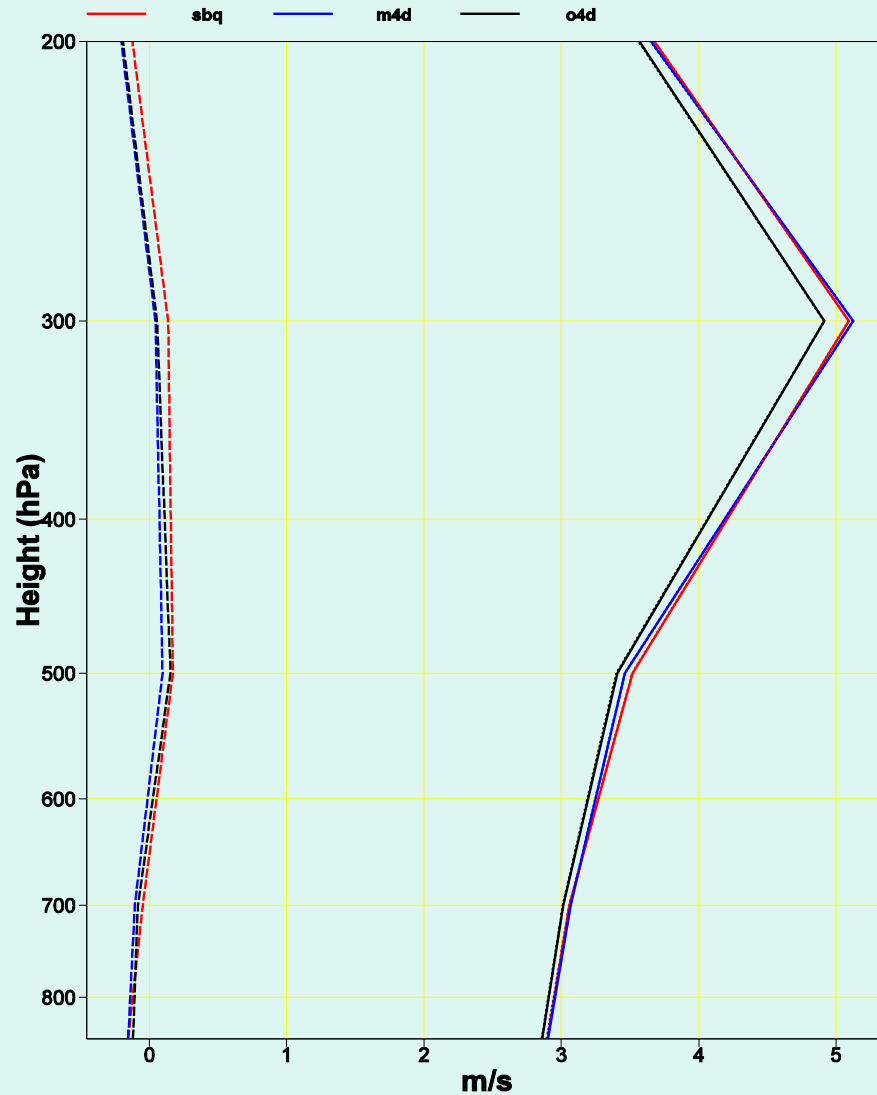
Mesoscale modelling status and plans

- Step 1: Getting acquainted with ALADIN, port HIRLAM physics subpackage to IFS (benchmark); make “reference” namelist setup available at ECMWF. Status: close to finished.
- Base subsequent developments of physics and dynamics (incl. surface) on AROME (physics+externalized surface) system
- Identify and port HIRLAM physics / surface / data assimilation concepts to be tested in, this system
- Comparative verification of developing system against benchmark
- Presently HIRALD version running daily in DMI, AROME versions in SMHI,FMI. Plans to implement mesoscale system in more HIRLAM countries.
- Physics/dynamics mesoscale joint developments already started; begin with data assimilation and use of obs work in 2d half of 2006.
- Start joint work on typical mesoscale aspects in physics, data assimilation and use of observations

Data assimilation:

- 4D-VAR tests: control of lateral boundary conditions, removal of bugs. Consistent positive impact wrt 3D-VAR.
- 4D-VAR training week in April; Preparations for implementation of 4D-VAR as reference
- Mesoscale data assimilation:
 - strategy: planning meeting in October, Zurich to decide on practical approach to tackle mesoscale challenges
 - Getting acquainted with ALADIN 3D-VAR/ODB system: Workshops in Budapest
 - Miniworkshop for determination of approach for more sophisticated physics for 4D-VAR (meso/synopt, scale) to be planned in September.
 - Observation operator convergence: start 2d half of 2006

Statistics for 61 stations
Wind speed
Period: 20050602-20050702
Solid RMS; Dotted STDV; Dashed BIAS; Number of cases 13998
Forecast lengths used: 12 24 36 48



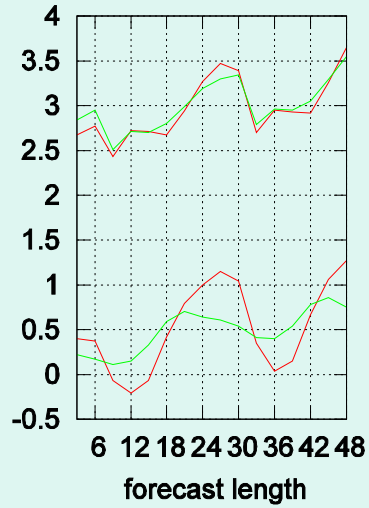
Use of observations

- New/improved types of observation to be included soon:
 - SYNOP 2,10m; scatterometer; AMV; OSI SAF SST, sea ice
- Observation operator convergence plans
- Radar, GPS: (joint) work ongoing
- Start with research on advanced imagers, sounders and clear/cloudy radiances: MODIS, AIRS/IASI, AMSU over land,
- Make use of SAF products/ algorithms as much as possible
- Surface data assimilation: strategy for next few years to be decided.

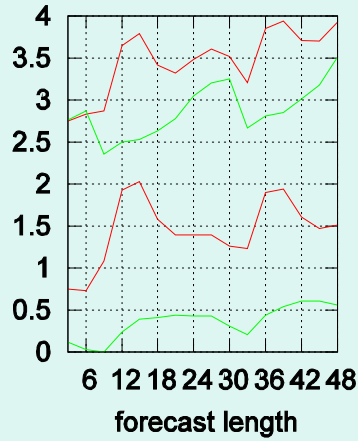
Forecast model

- Synoptic scale: Preparation of moist CBR (tuning with convection)
- MSO/SSO and sloping surface radiation schemes tested with positive impact, ready for porting to mesoscale model where appropriate.
- Work on mesoscale combined turbulence-shallow convection (EDMF) scheme started.
- Dynamics: start made with activities in common HIRLAM-ALADIN plans: mercator map factor, vertical finite element, horizontal pressure gradient near orography.
- Initial experiments with coupling to atmospheric chemistry
- Surface model and snow scheme: revised version yielding promising results
- Lake model activities planning meeting in Helsinki, work started
- Inclusion of urban characteristics in surface model: preliminary experiments, to be intensified

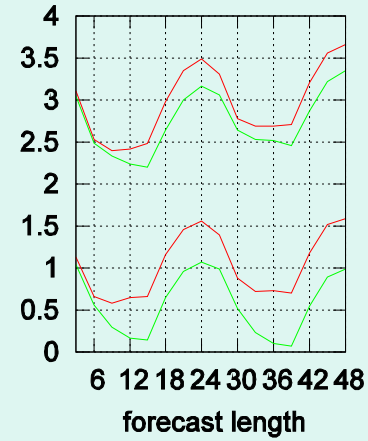
Temperature mars2006-00z



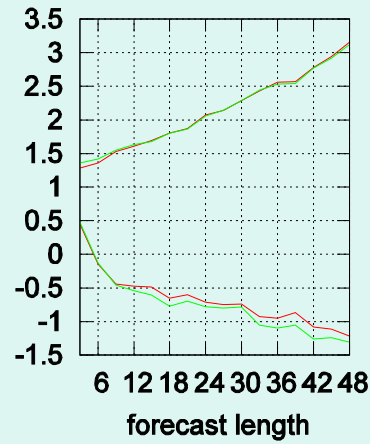
Dew point



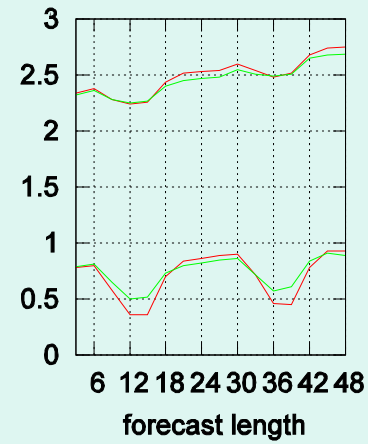
Cloudiness octas



Mean sea level pressure



10-m wind m/s



CrL —
Cs6 —

Predictability

- Activities in this area until now mostly at national level. Needed: integration of these experiences into a HIRLAM/ALADIN short-range predictability system.
- Formulate common HIRLAM-ALADIN plans on predictability: March workshop, Madrid.
- Create GLAMEPS:
 - HIRLAM-ALADIN grand ensemble, produced in distributed manner for common area, and combining variety of methods
 - Start with presently developed methods and systems, gradually add and test new methods for ensemble creation
 - Calibrate ensemble and evaluate contribution of individual methods using BMA
 - Laboratory system environment: to be set up at ECMWF
 - More detailed work plan to be set up. June: planning meeting for GLAMEPS system aspects

System and applications (1)

Verification and validation:

- Regular analysis of verification of RCR for identification and solving of model problems.
- Extensions to routine RCR monitoring/verification system (e.g. more data usage monitoring, O-B statistics, ...)
- Based on Oslo workshop: initiation of common mesoscale validation and verification working group

Maintenance of the Reference System: a bigger task!

- Apart from cleaning and improving synoptic scale system:
- Mesoscale system: repository, standard setup and national “branches” to be maintained at ECMWF
- Participation in common phasing efforts
- And creating system setup for GLAMEPS

System and applications (2)

- Operational cooperation:
 - System group user support for operational problems
 - Creation of web data portal of operational products
 - Inventory of postprocessing products and tools of general relevance
 - Preprocessing: ?