

The operational ALADIN models

(kullmann.l@met.hu)

There were only small changes in the operational version of the ALADIN/HU model during the first half of 2008:

- x We use ATOVS (AMSU-A and MHS) data from the NOAA18 satellite operationally.
- x An automatic update of ATOVS bias correction files was implemented.
- x We run our Dynamical adaptation reference parallel suite on the operational SGI machine on cy30t1.
- x Our post processing is based on 15 min. frequent outputs of the production forecast.
- x We use the high resolution ARPEGE LBC files (as all the members).

The main characteristics of the recent deterministic operational suite:

- x ALADIN cycle: cy30t1
- x Horizontal resolution: 8 km
- x Vertical levels: 49
- x Grid: linear
- x Data assimilation: 3d-var with 6h cycling
- x Observations: SYNOP (geopotential), TEMP (temperature, wind components, humidity, geopotential), AMDAR (temperature, wind components), ATOVS:AMSU-A and AMSU-B radiances, MSG/GEOWIND (AMV), SYNOP SHIP, WINDPROFILER.
- x Production is performed 4 times per day: 0 UTC (+54h), 6 UTC (+48h), 12 UTC (+48h), 18 UTC (+36h).

The quasi-operational dynamical downscaling of Meteo France's PEARP system by the ALADIN model started in February.

The main characteristics of this ALADIN model version are as follows:

- x Horizontal resolution: 12 km
- x Domain covering basically the continental Europe (LACE domain)
- x Vertical resolution: 46 levels
- x Integration once per day to 60h starting from the 18 UTC data
- x Boundary conditions updated every six hours by the ARPEGE EPS (PEARP) system.

At present work is going on in the field of visualization and verification of this ALADIN LAMEPS system.

Parallel suites during the period:

- x Dynamical adaptation as a reference to 3d-var system at same vertical and horizontal

resolution (moved to the operational SGI machine and based on cy30t1).

- x An atmospheric 3d-var + surface OI (Canari) data assimilation suite was run and compared to the operational 3d-var suite.

Major ALADIN developments

The main scientific orientation of the Hungarian Meteorological Service for the ALADIN project is unchanged: data assimilation, short range ensemble prediction and high resolution meso-gamma scale modelling (AROME model).

The main scientific developments for the first half of 2008 can be summarized as follows:

- x DATA ASSIMILATION:

1. The main development during the first half of 2008 was the implementation of the Canari surface OI assimilation in our service. After the validation of conf. 701 a parallel suite was run for 2 months during the early summer period. The reference was the operational data assimilation suite where we use the Arpege analysis on the surface. As the scores (against observations) show a benefit of the local Canari assimilation, an operational implementation is planned soon.
2. We kept doing tests with SEVIRI and SYNOP T and RH data over the winter period of 2007. Our aim was to reproduce similar results obtained by Alena Trojáková for a summer period of 2006 (neutral classical scores and promising QPF scores for precipitation). This was done without success, namely with worsening classical scores due to the use of SEVIRI and SYNOP (T,RH) data. Finally promising attempts were done to tune humidity standard deviations (both background and observation) resulting in an emphasized improvement of RH classical scores both using SEVIRI and SYNOP data.

- x LAMEPS:

With the stay of Richard Mladek work has been continued with the ALADIN singular vectors. On the basis of the careful examination of the singular vectors it seems that they are realistic and can be used for creating initial perturbations for a LAMEPS system. First tests were made to create initial condition perturbations based on the method applied at Meteo France.

- x AROME:

1. In Surfex there are three possible ways to diagnose the screen level fields (T2m, RH2m and wind at 10m): Paulson, Geleyn and Canopy scheme.
The verification against observation was done for all the three schemes. Canopy and

Paulson schemes have similar scores while the Geleyn scheme has a cold bias in temperature during stable situations. A new interpolation formula was introduced based on the Geleyn scheme and a new stability function proposed by Gratchev et al. The new formula improves significantly the verification scores with respect to the original Geleyn scheme and gives similar results as the other two schemes.

Since the Canopy scheme is a prognostic scheme it is not applicable in 3dVar assimilation. The idea is to use Canopy scheme for the direct obs operator and use the new formula for its TL and adjoint.

2. To investigate the use and applicability of FLake in SURFEX for the Lake Balaton, a large, shallow lake, we have compiled a database of relevant observations. The collection of data required the cooperation of various research institutes, academia, and environmental monitoring agencies. The database allows us to test FLake using a known atmospheric forcing and assess its performance for this particular lake. We have conducted a preliminary offline test using data for the summer of 2006.