

National status report (poster) of HMS

1. Operational configuration
2. Data assimilation (3D-VAR)
3. LAMEPS experiments
4. Downscaling of ERA40 (wind climatology)
5. Verification (objective, subjective)
6. Visualization, grid editing, environmental applications

IN based LAMEPS project was formulated and discussed with our French colleagues. The main motivation of this project is to develop a probabilistic forecast for Hungary for T 2m, wind 10m and precipitation in the 12-48h time range. Our final goal is to have a fully operational LAMEPS system until 2007.

Validation and visualization tools

Validation tools were developed mostly based on Metview and ALADIN FA files must be converted into GRIB format. At present, the tools include: Reliability diagram, ROC and Talagrand indices spaghetti plots, plume diagrams, members, ensemble mean

Ensemble forecasts with ALADIN

Boundary conditions for the LAMEPS forecasts are provided directly by the ECMWF. The initial perturbations of the global system are based on the configuration run in Toulouse (PEACE) uses 12 hour optimization area covering the North Atlantic region. This provides enough spread over Western Europe in the 48-72 h time-range. Because in our LAMEPS experiments we are interested in the region and time-range we are planning to test different configurations better fitted to our needs (global runs performed in Toulouse).

The optimization area (including more of Central Europe) is used for 12 and 24 h optimization times.

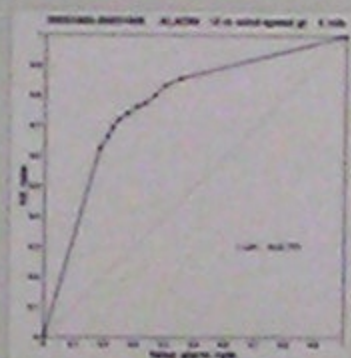
ARPEGE at HMV and performed a few LAMEPS runs. At present, we are investigating events with large precipitation over Hungary.



The three optimization areas used for the singular vector computations with ARPEGE in the LAMEPS experiments. The dashed red rectangle denotes the optimization area for PEACE.

Validation for the 12h July event at 42h forecast. Initial and boundary conditions provided by ECMWF based on the 5V analysis region.

Forecasted by ALADIN. To be validated. This is the final (upper) optimization area used in the



ROC diagram for the event when 10 m wind speed exceeds 5 m/s - based on only four ALADIN LAMEPS runs.

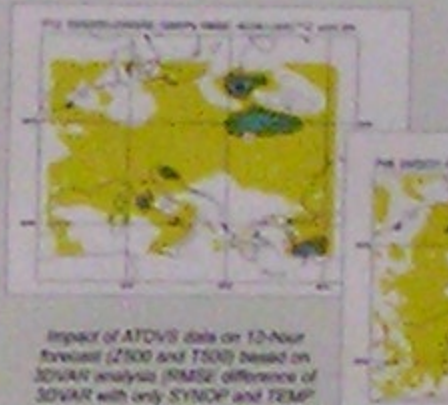
well. However, development of the data screening is required in order to gain as much information as possible from the raw data.

The ongoing work will continue with the investigations of the following observation types:

- ATOVSIAMSU-B (sensitive to humidity)
- Windproilers
- MSG clear-sky radiances
- MSG SATOB cloud motion winds



Typical location of satellite data used in 3D-Var



Impact of ATOVS data on 12-hour forecast (2500 and 7500) based on 3DVAR analysis (RMSE difference of 3DVAR with only SYNOPT and TEMP observations and 3DVAR using ATOVS data)

Dynamical downscaling of ECMWF reanalysis

The main motivation of the project is to obtain a high-resolution climatology of wind and precipitation for Hungary. The investigated period is 10 years (1992-2001) and the target resolution is 5 km. Due to the big resolution difference between the input and the output grid downscaling will include several intermediate steps using ALADIN.

The input is the ERA-40 ECMWF reanalysis

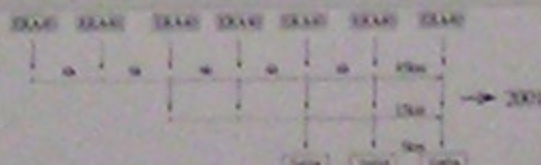
- 40 years of homogeneous assimilation cycle using 3D-Var
- ~125 km horizontal resolution (T159), 60 vertical levels

Downscaling strategy

- Double nesting will be used in order to avoid big resolution jumps
- ALADIN will be run at first with 45 km and then with 15 km horizontal res.
- The final 5 km resolution will be reached with dynamical adaptation (ALADIN DADA)

Forecast range

- A trade-off was needed between the shorter and longer integration times because:
 - at shorter integration times the spin-up can be significant
 - at longer integration times accuracy decreases
- Solution: 36-hour integration on both 45 km and 15 km, but the first 12 hours will not be used



Intermediate ALADIN domain with 45 km horizontal resolution

Intermediate ALADIN domain with 15 km horizontal resolution

Final domain for ALADIN DADA with 5 km horizontal resolution