Regional Cooperation for
Limited Area Modeling in Central Europe

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Status & plans at CHMI

A. Trojakova, P. Benacek

DHMZ SHMU OMSZ ZAMG ROMANIA ANM

Motivation

The ALARO-1 6h cycling by Digital Filter Blending is operational at CHMI (Brozkova, 2001) and the BlendVAR is close to its implementation, but recent studies by Benacek (2014) support an increase of analysis frequency to reduce time representativity errors for polar satellite data assimilation (and to implicitly increase assimilated observations).

Furthermore, within the national project to improve forecasts for Air Traffic Control (ATC) we are interested in getting experiences with high resolution observations as MODE-S, wind-profilers and HRW data. Regarding methods the variational diagnostics analyses of T and wind and 6h(-3h) BlendVAR for NWP forecasts will be considered.

There is no plan to investigate the hourly Rapid Update Cycle at CHMI for operational purposes in the near future, but we are interested in related issues (high resolution observation availability, background error modelling, VARBC and initialization aspects).

ALARO at CHMI

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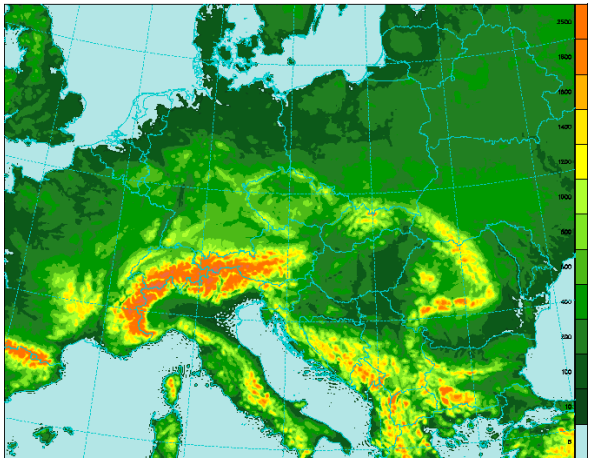
- domain (529x421 grid points, linear truncation E269x215, dx 4.7km)
- 87 vertical levels, mean orography
- time step 180 s
- OI surface analysis based on SYNOP (T2m, RH2m)
- Digital Filter spectral blending of the upper air fields, long cut-off cycle (6h cycle, filtering at truncation E87x69, no DFI in the next +6h assim guess)
- Digital Filter blending + incremental DFI initialization of short cut-off production analysis of the upper air fields
- 3h coupling interval
- 00, 06, 12 and 18 UTC forecast to +54h
- ALADIN cycle 38t1tr (ALARO-1)



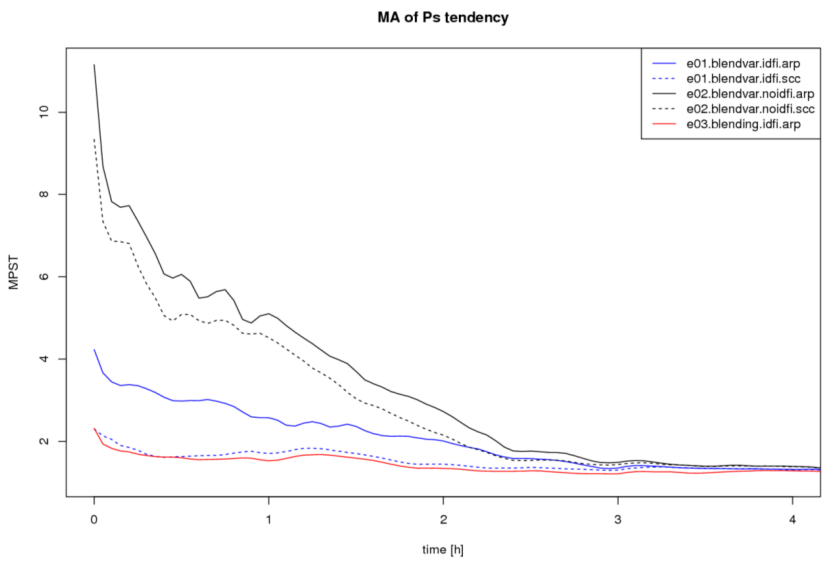
Preliminary results

Rapid Update Cycling (RUC)

- has potential to improve use of polar satellite, see Benacek (2014), http://www.rclace.eu/File/Data_Assimilation/reports/AssimWin.pdf
- but complete evaluation of 3h cycling has not been finished.

Initialization aspects

- Space Consistent Coupling (SCC) and IDFI (in production) reduce noise in analysis and first hours of integration;



Time evolution (in hours) of the mean absolute surface pressure tendency MSPT averaged over the interior model domain. BlendVAR NOIDFI in black, BlendVAR IDFI in blue and SCC exps dashed.

Challenges and opportunities

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Challenges

- step towards the hourly RUC is not straightforward due to spin-up,
- we aim to keep blending (and/or start investigation on use of large-scale information for LAM analysis&forecast via Jk).

Opportunities for CHMI in 2015

- investigate further 3h cycling;
- evaluate impact of local DA on B estimation to reduce spin-up;
- check availability and evaluate impact of MODE-S, wind-profiler and HRW data;
- eventually, continue investigation of grid-point sigmaB maps.

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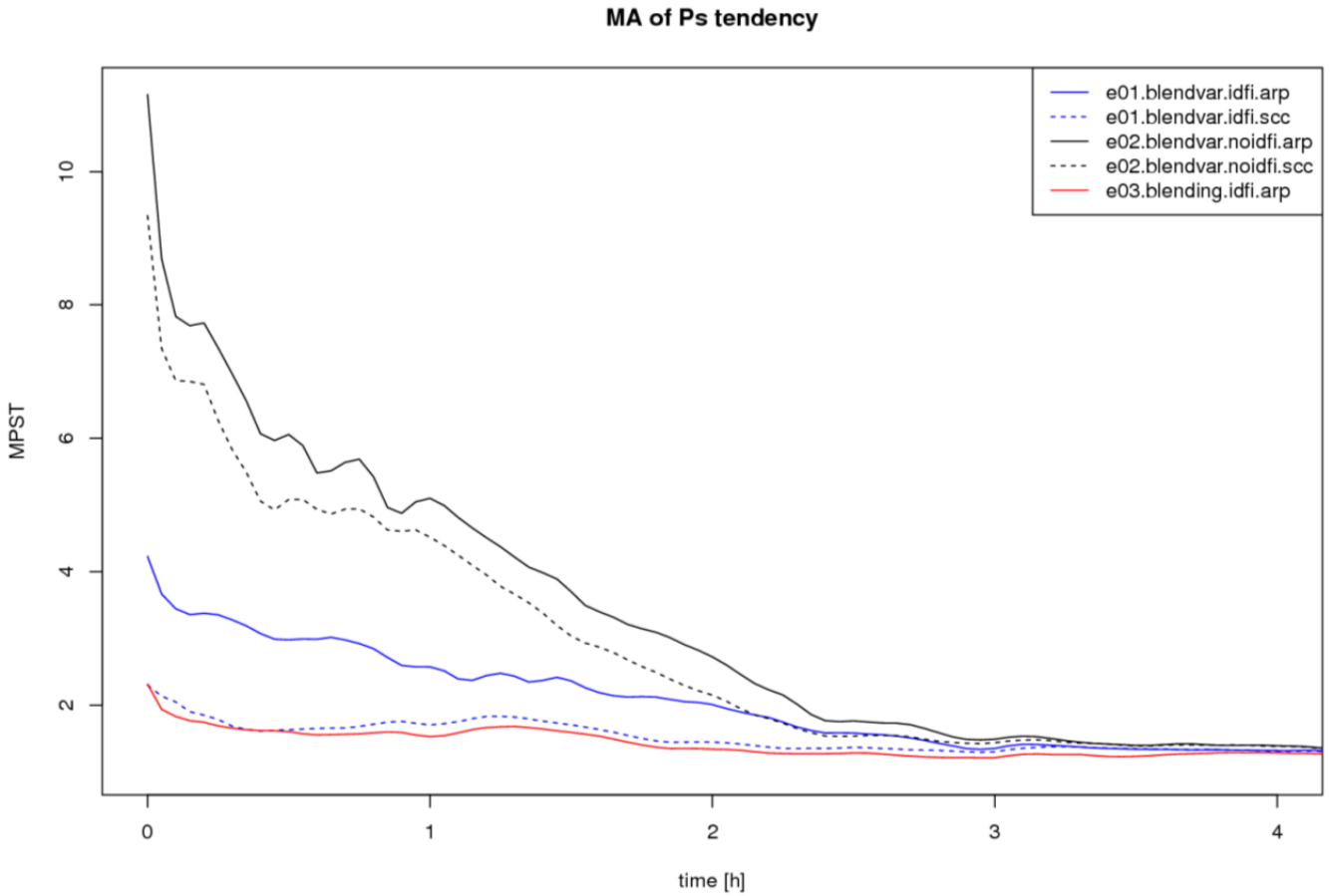
Thank You for Your attention !

Additional slides



Time evolution (in hours) of the mean absolute surface pressure tendency MSPT averaged over the interior model domain.