Operational Aladin-Belgium

Main features

- Model version: AL29t2.
- AL32t3 + ALARO-0 + 3MT in parallel run.
- 60 hour production forecasts four times a day (0, 6, 12 and 18 UTC).
- Lateral boundary conditions from ALADIN-France and Arpege global model.

The computer system

- SGI Altix 3700BX2.
- 56 Itanium2 1,5 Ghz 6Mbyte CPU's.
- Peak performance: 4.1 Gflop/processor.
- 104 Gbyte internal memory.

RMI

Model geometry

- 7 km horizontal resolution   (240*240 points).

- 46 vertical model levels.

- Linear spectral truncation

- Lambert projection

Forecastings settings

- Digital filter initialization (DFI).

- 300 s time step (two time level semi-implicit semi-Lagrangian - SISL - advection scheme.

- Lateral boundary condition coupling at every 3 hours

- Hourly post-processing

RMI
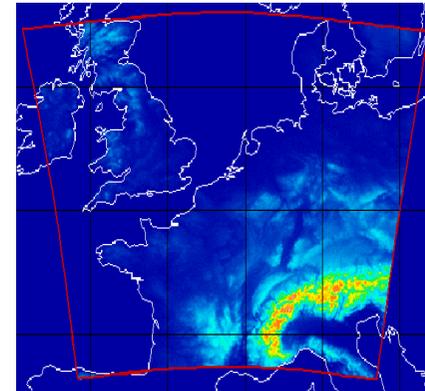
Operational suite/technical aspects

- Transfer of coupling file from Météo-France via Internet (primary channel) and RMDCN (backup).

- Model integration on 16 processors.

- Post-processing on 8*1 processors.

- Monitoring with SMS (Supervisor Monitor Scheduler).

RMI

The Alaro-0 project and the 3MT package

Alaro-0 was developed for operational forecasts at high resolution, with meshes between 15 and 2 km, including the grey zone resolutions.

Model scores

- Quality of upper-air and surface parameters is at least as good as the operational Aladin model
- Evolution and structure of precipitation and clouds are significantly improved

RMI

Thin precipitation lines on 1 October 2006

At 7 km resolution, the structure of the precipitation and its evolution are significantly improved by Alaro-0. Representing the very narrow precipitation bands would require a resolution finer than 2km; however their occurrence and general appearance are quite well suggested in the 4.01 and 2.18 km forecasts.
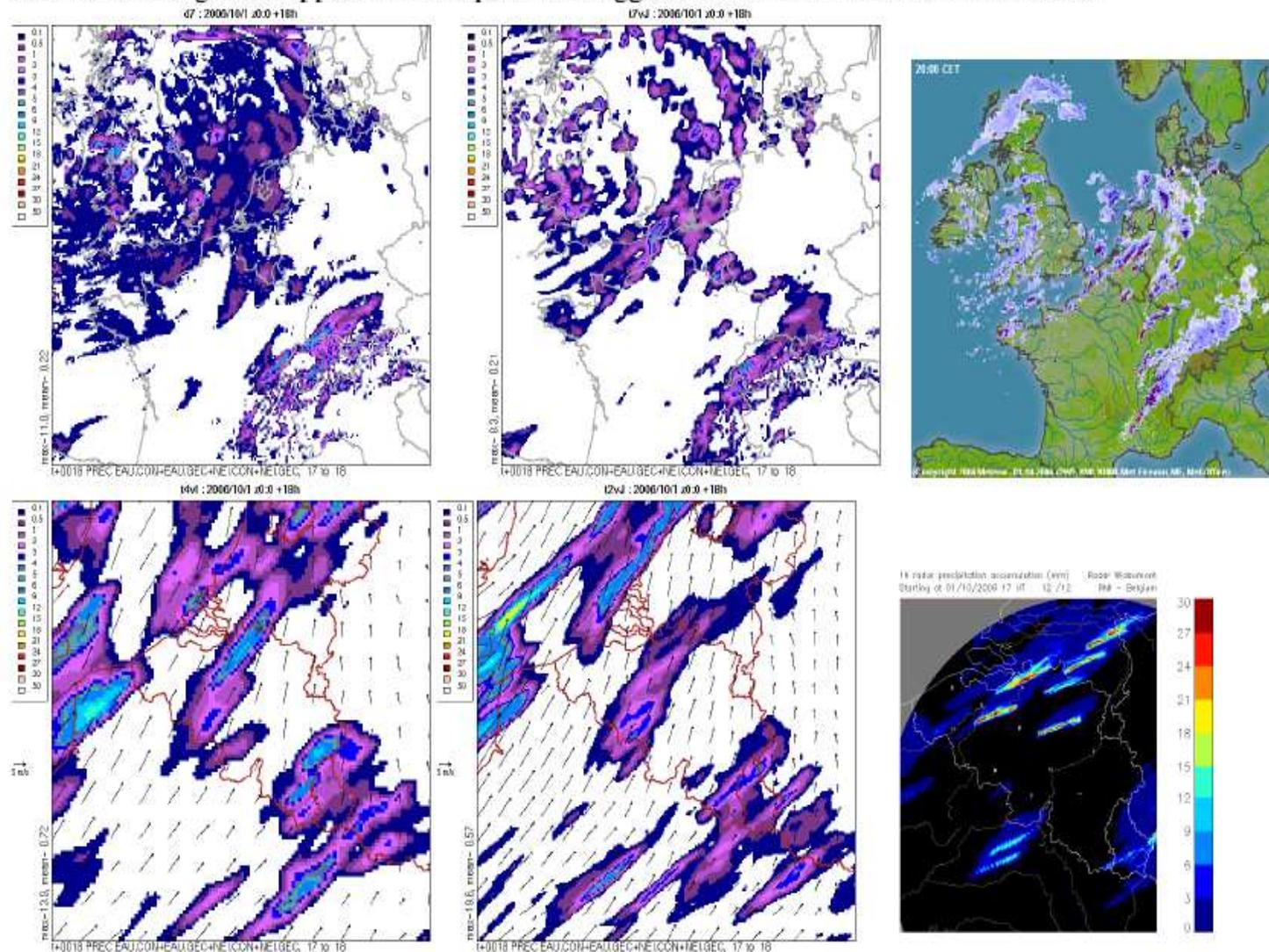

Figure 4: 1-hour accumulated precipitation, 10m wind. Top: Classical Aladin model (7km), Alaro-0 model (7km), instantaneous composite image from European radars. Bottom: Alaro-0 (4.01km), Alaro-0 (2.18km), 1-hour accumulated radar image over Belgium.

Including atmospheric layers in vegetation and urban offline surface schemes

SURFEX VALIDATION

- A formulation to include prognostic atmospheric layers in offline surface schemes is derived from atmospheric equations.
- In the validation study both **SURFEX** and **ALADIN** 2-m temperature have been compared from October to December 2007 to the observations.
- Surfex improves the scores in most of the cases

RMI

UCCLE
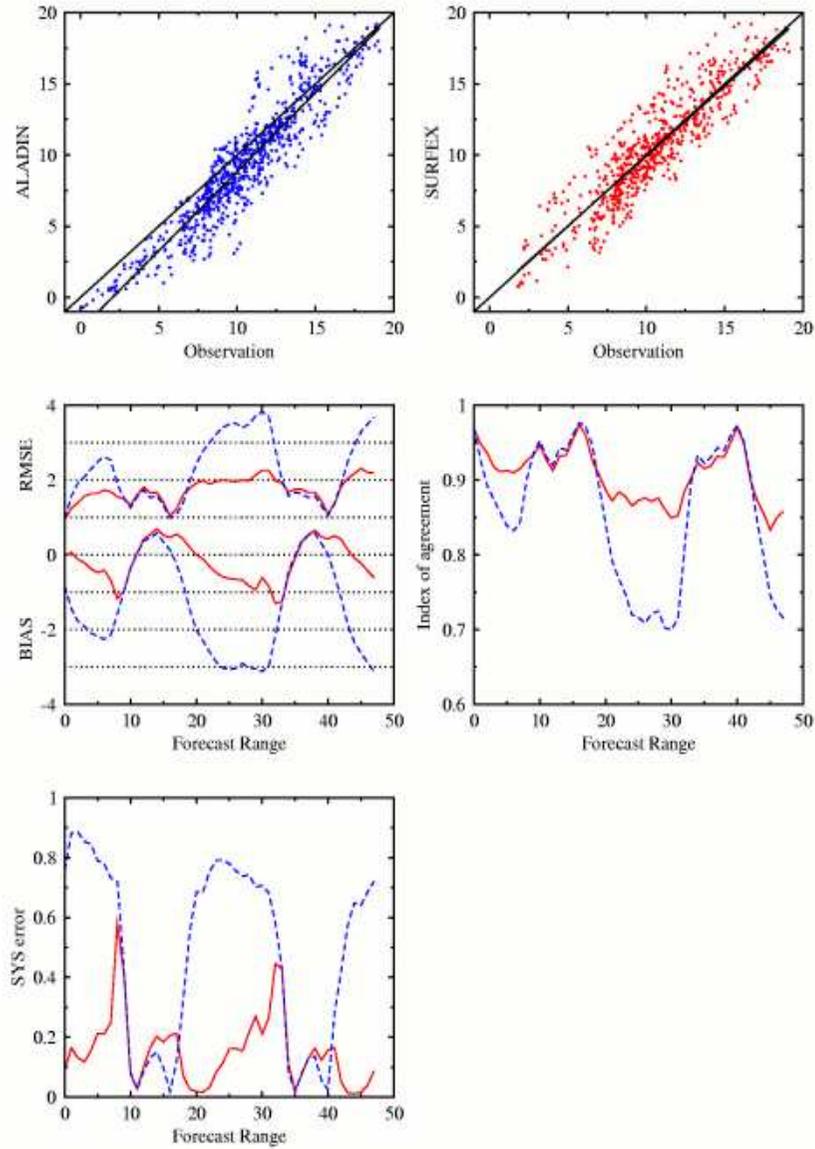
Averaged errors over 48h forecast
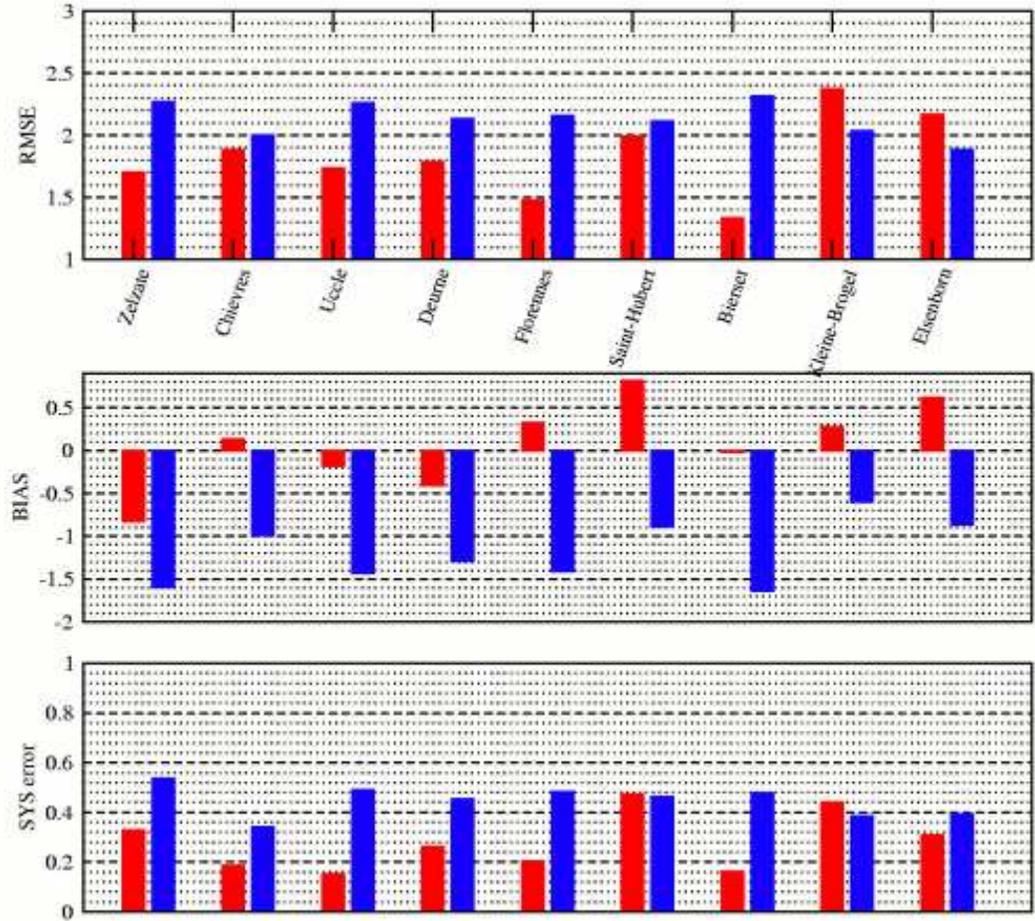
LATERAL BOUNDARY CONDITIONS

This work quantifies the required temporal resolution of the Lateral-Boundary-Conditions (LBC).

- For a mesoscale model, in standard forecast cases, coupling updates of about three hours are sufficient.
- However, in rare cases of severe storms strong discrepancies between the forecasts of the coupled and the coupling model can be observed.
- An index was developed to monitor the data loss due to the coupling.
- In those cases it is proposed to restart the forecast after the signal has entered the domain.

RMI