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ALARO Operational Suite

Characteristics

- cy40t1 – **ALARO-0 baseline**;
- semi-implicit semi-Lagrangian 2TL, $\Delta t=240$ s;
- $\Delta x=6.5$ km, 240 x 240 points, 60 vertical levels, linear grid, Lambert projection;
- LBC from ARPEGE (3h frequency), DFI Initialization;
- 4 runs /day 00, 06, 12, 18 UTC - no DA;
- forecast range: 78/54/66/54 hours;
- physical parameterizations : ALARO-0 including developments concerning thermodynamics adjustment, microphysics, moist deep convection.

Downstream applications

- Atmospheric input from ALARO for:
- hydrological model
 - wave model

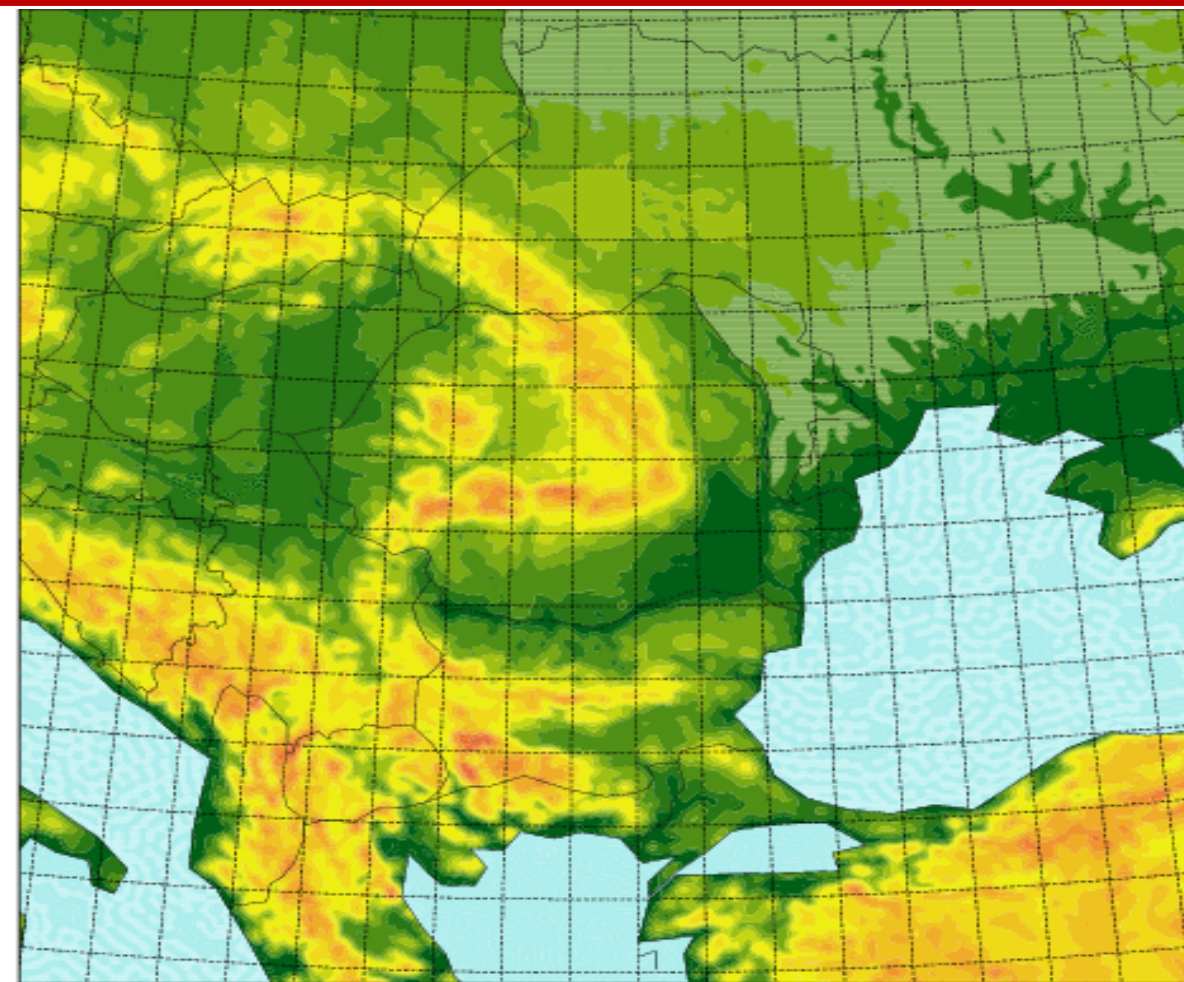
Post-processing

- FULLPOS in line - geographical grid (0.06° x 0.085°)

Visualization

- Graphics based on package developed within NMA and RC-LACE, based on grib_api, perl and NCL-NCAR

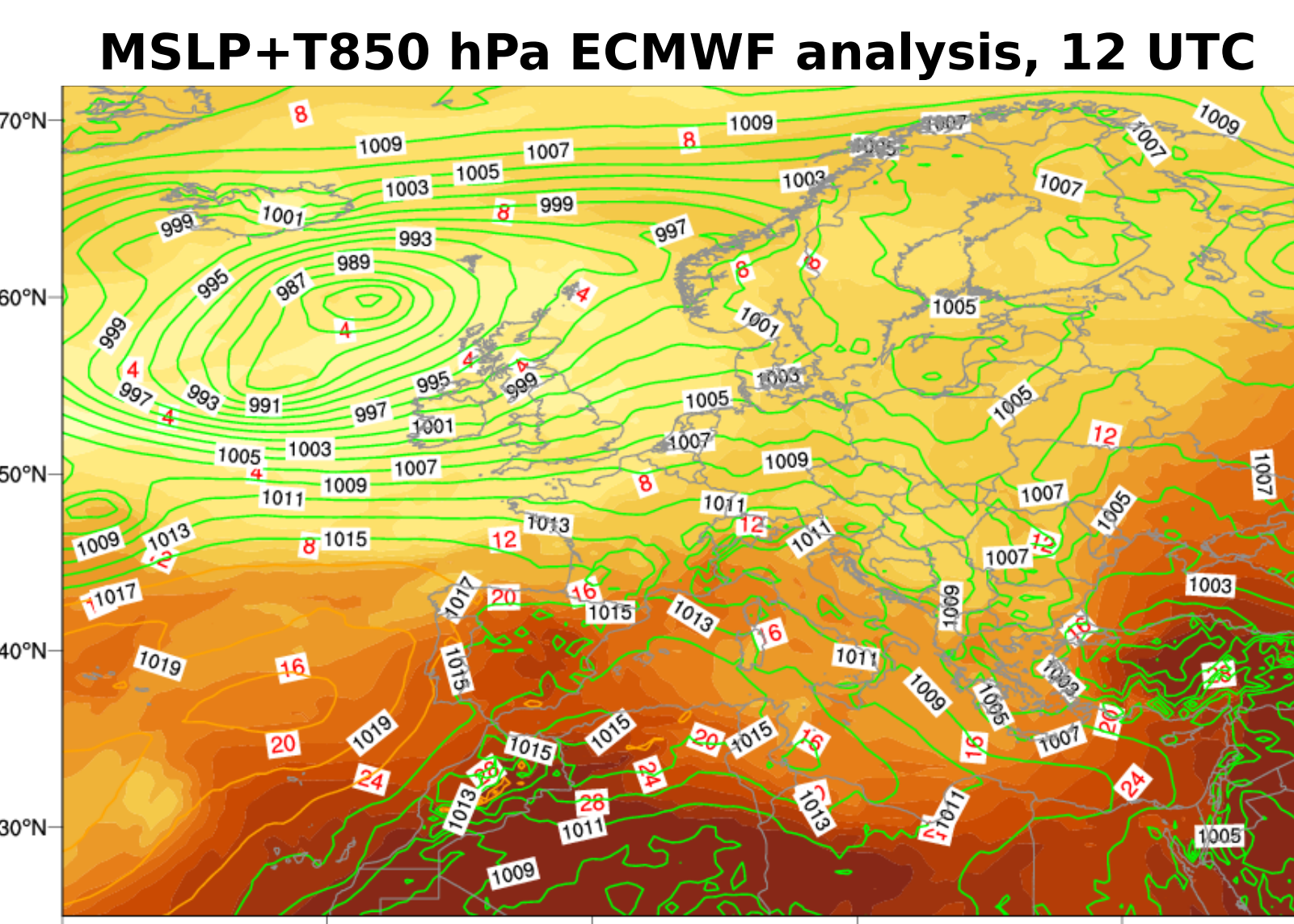
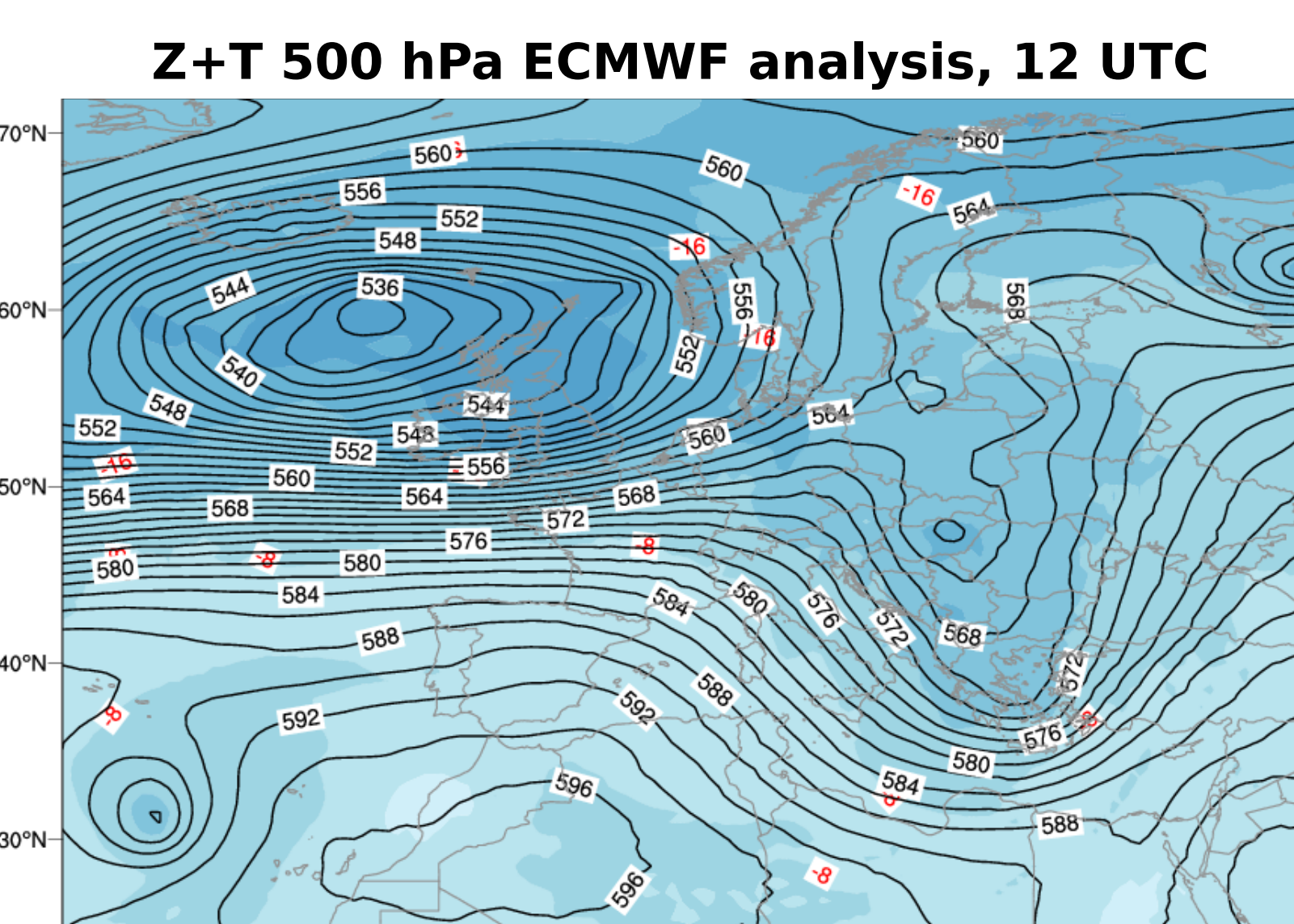
Statistical Adaptation Verification



Case study: 27.07.2017- Testing ALARO-1 versions

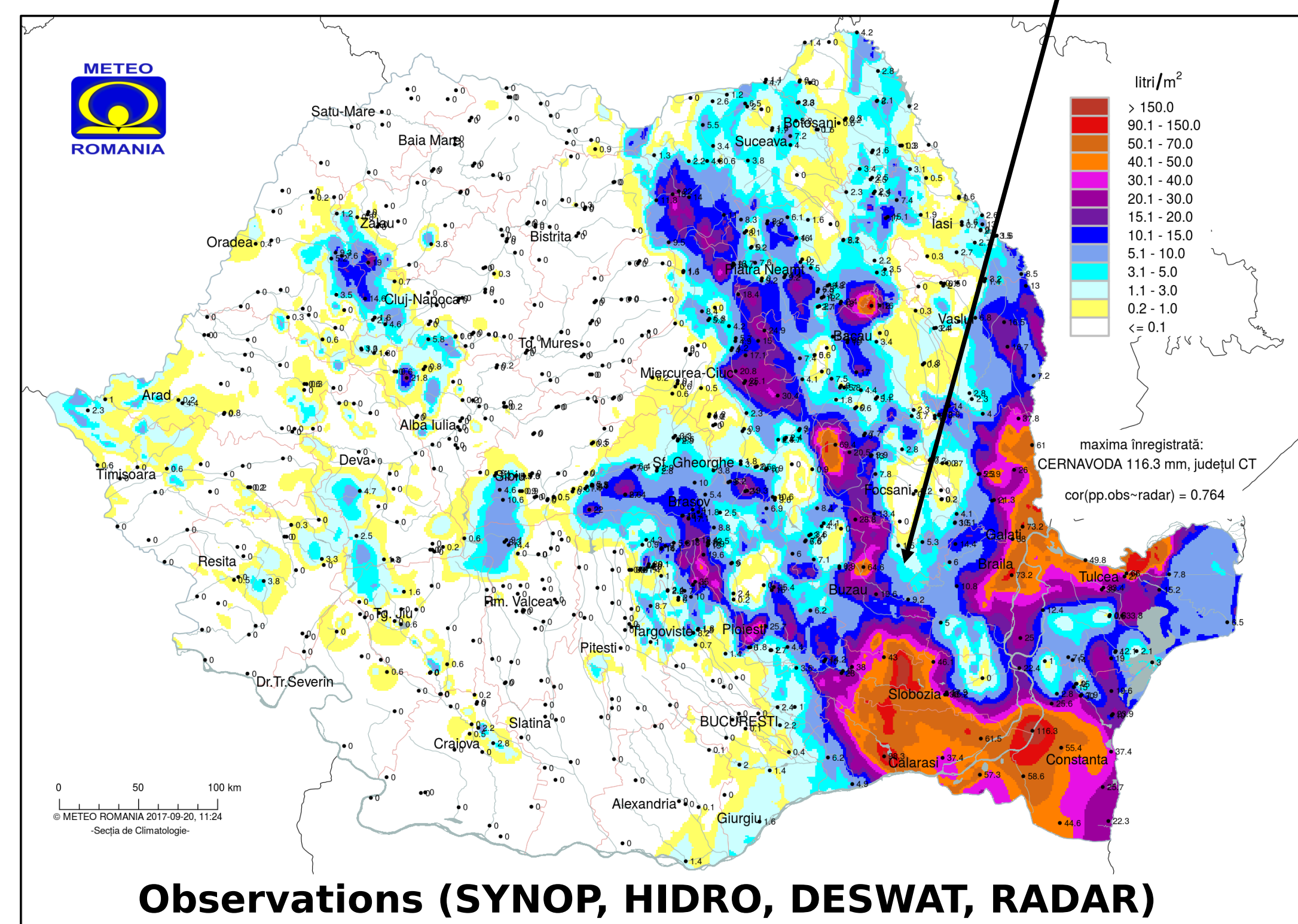
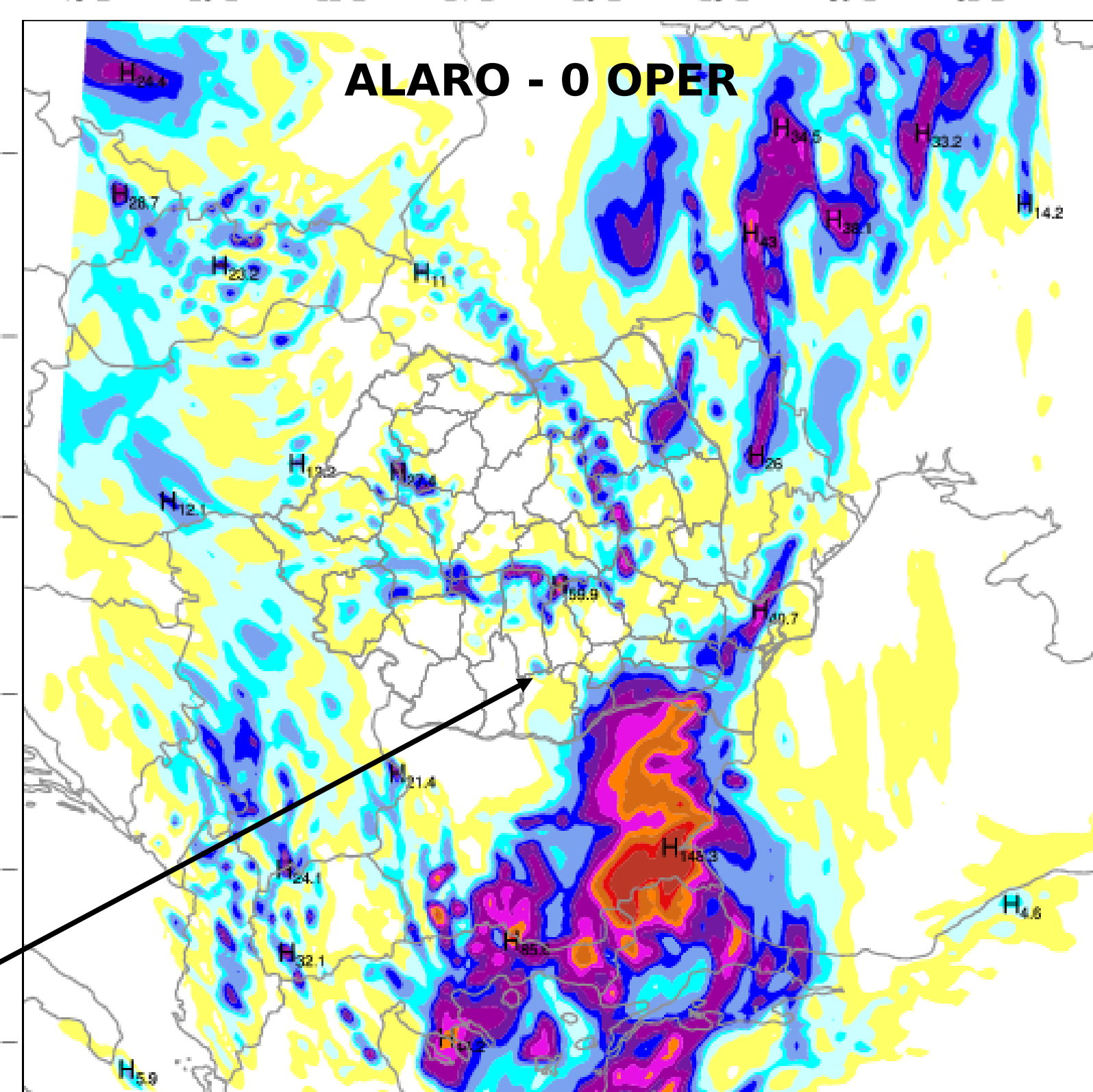
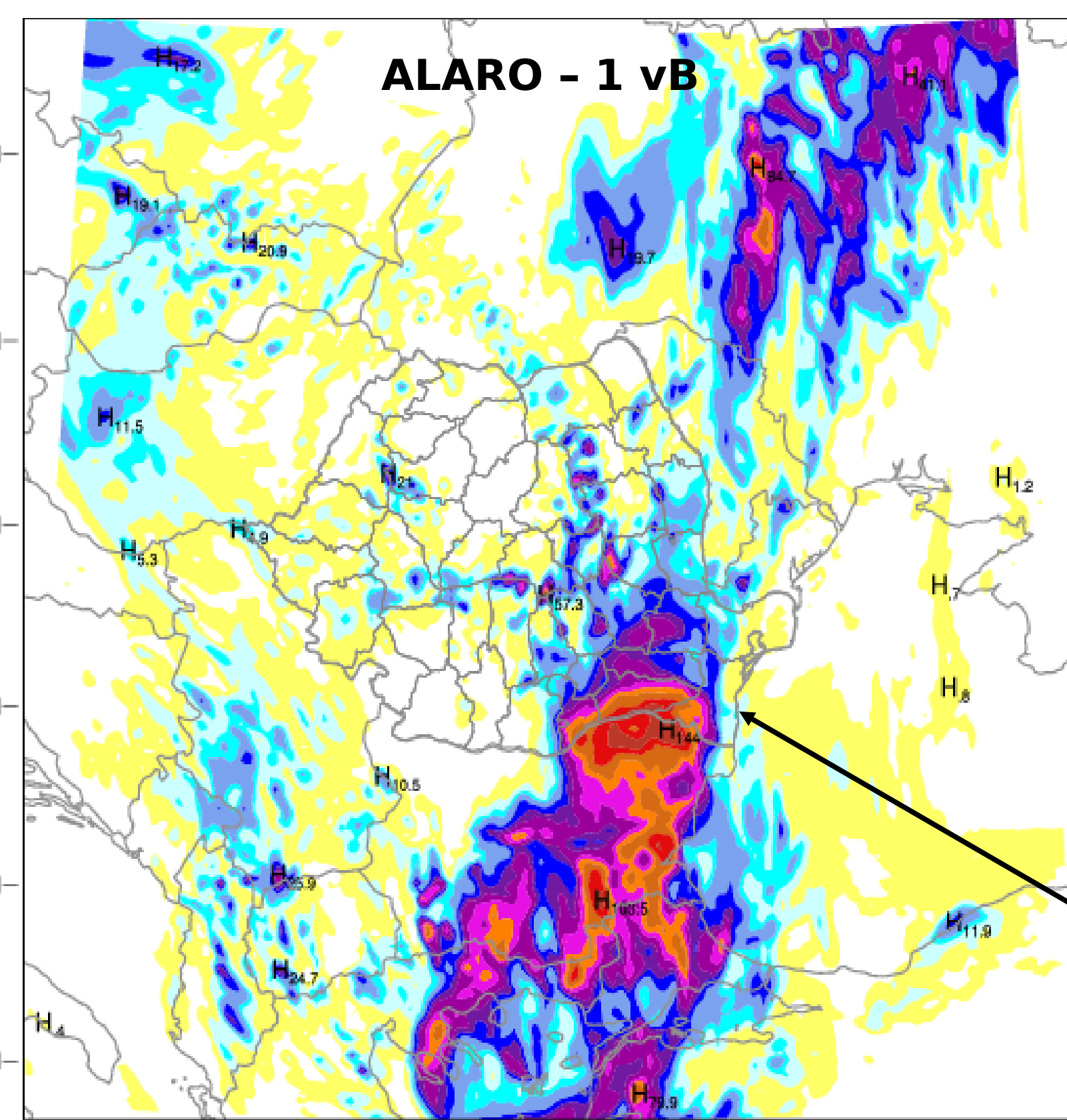
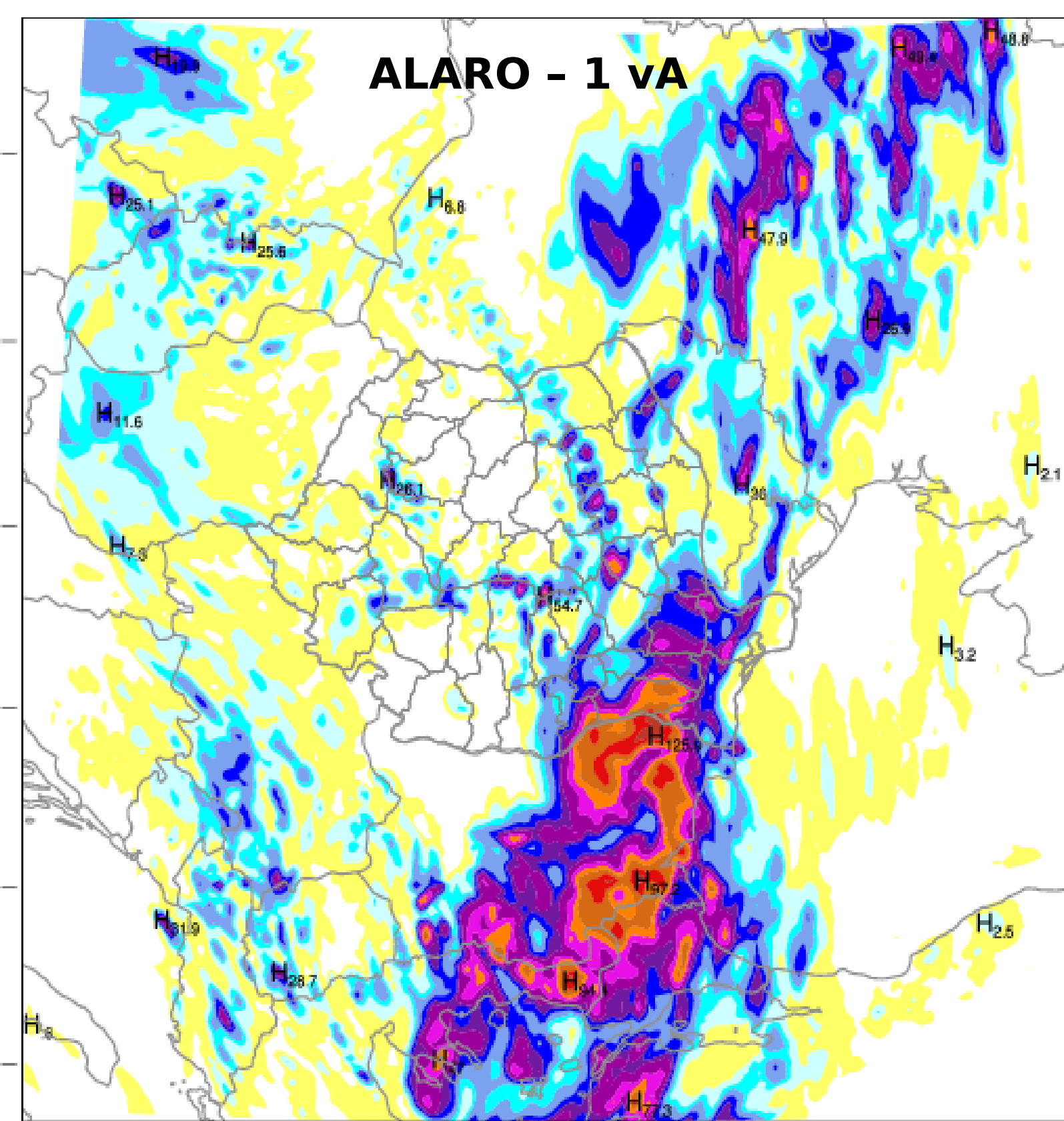
The operational version

- simulated smaller amounts of precipitation with respect to the observations in the south-eastern part of Romania
- heavy precipitation structure is shifted outside of the country



- the rapid trough passage affected the eastern part of Romania leading to increased atmospheric instability
- lack of precipitation

24h cumulated precipitation, 27.07.2017 - 28.07.2017, 06 UTC



ALARO-1

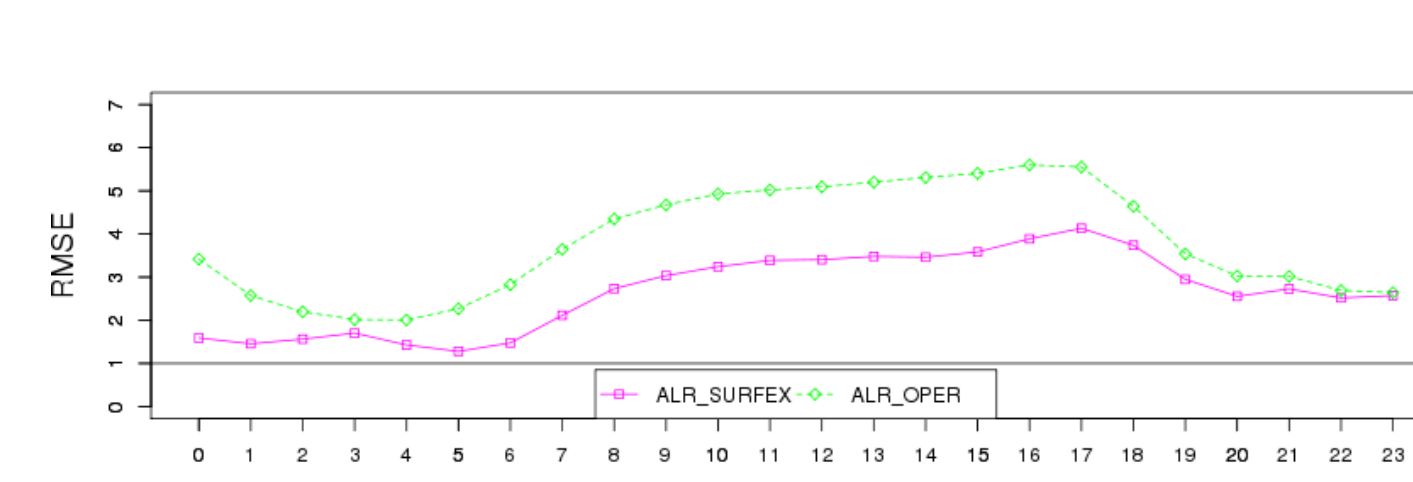
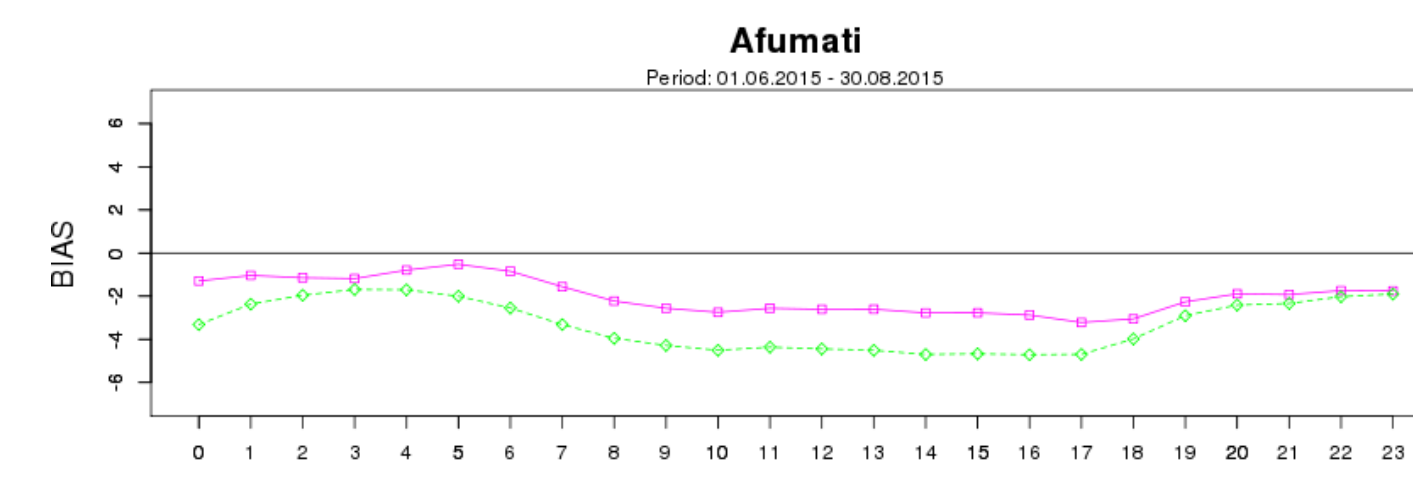
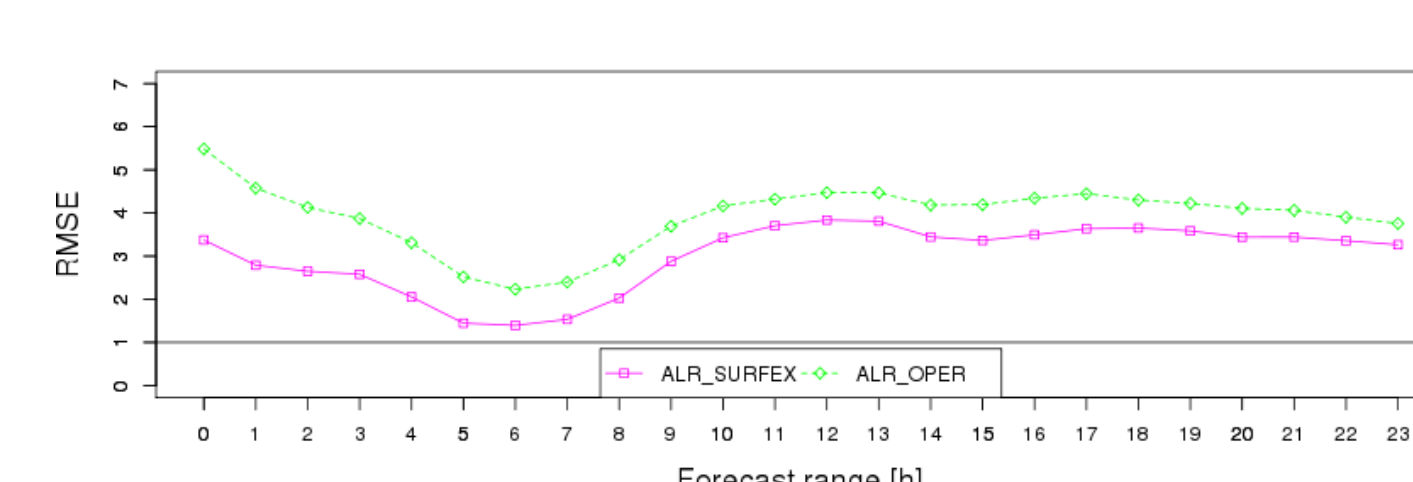
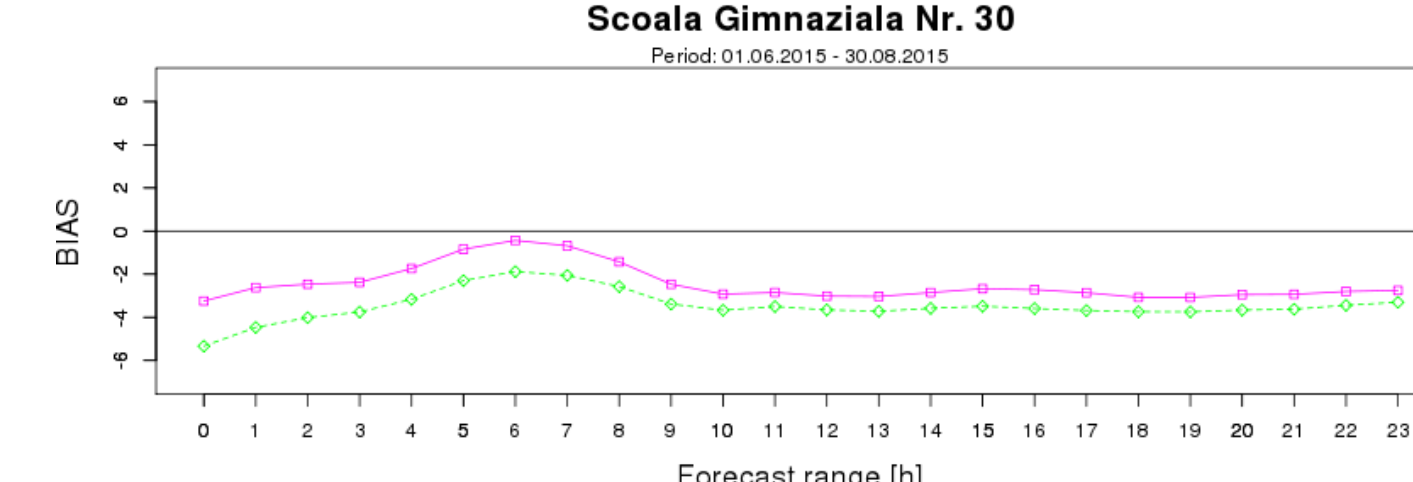
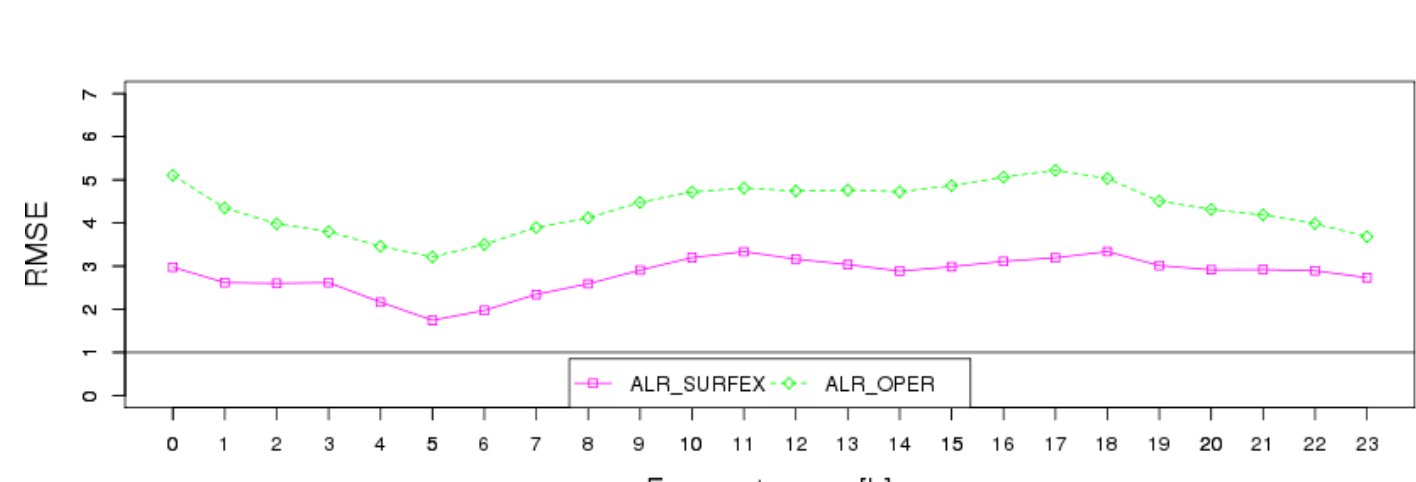
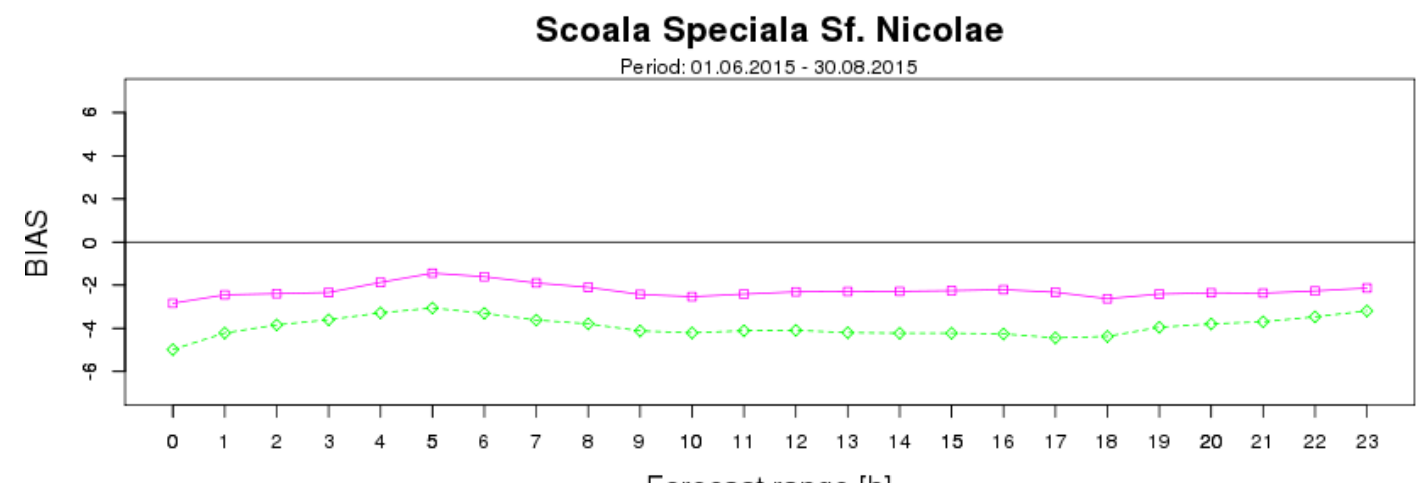
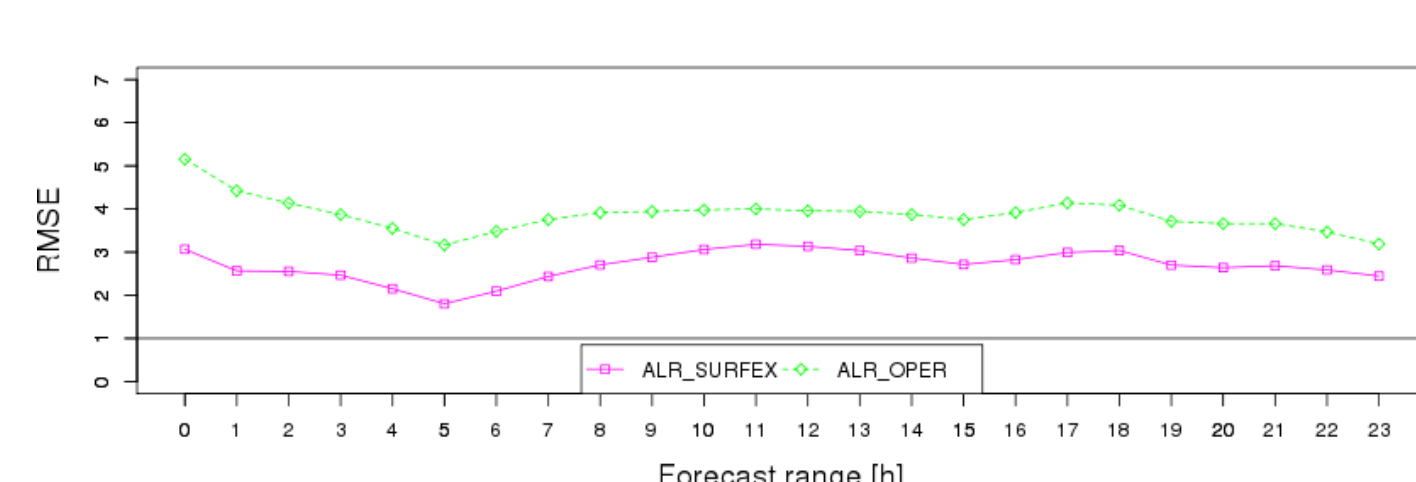
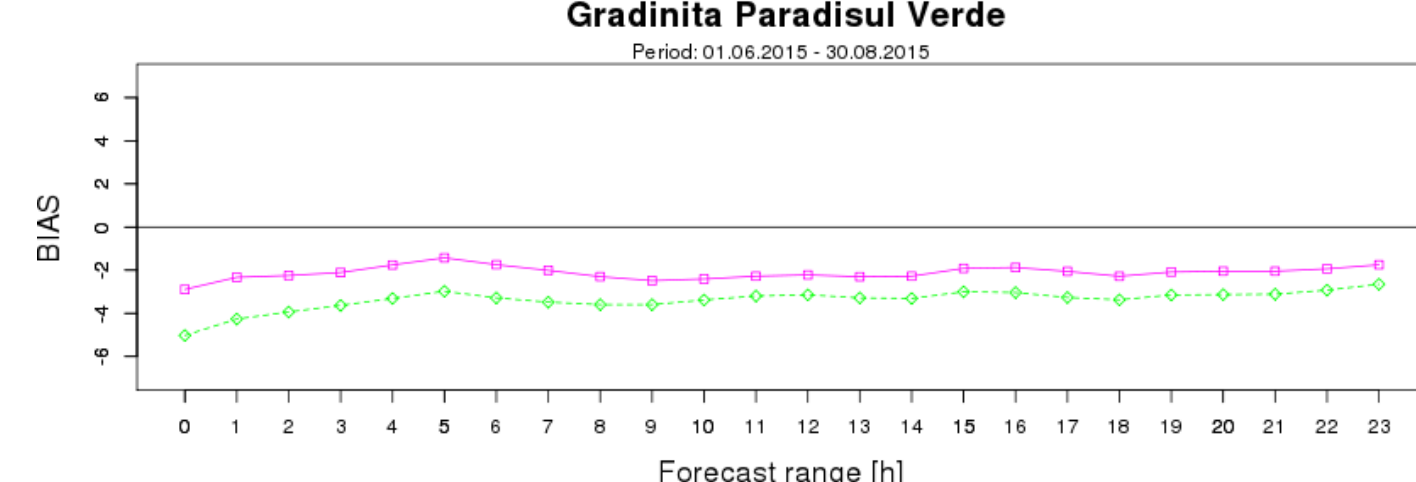
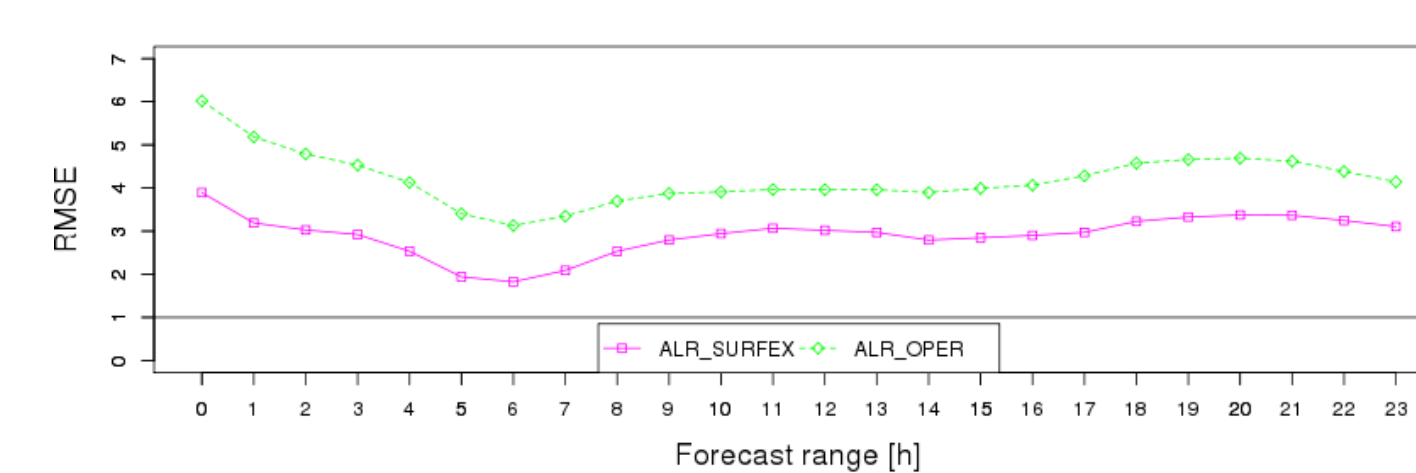
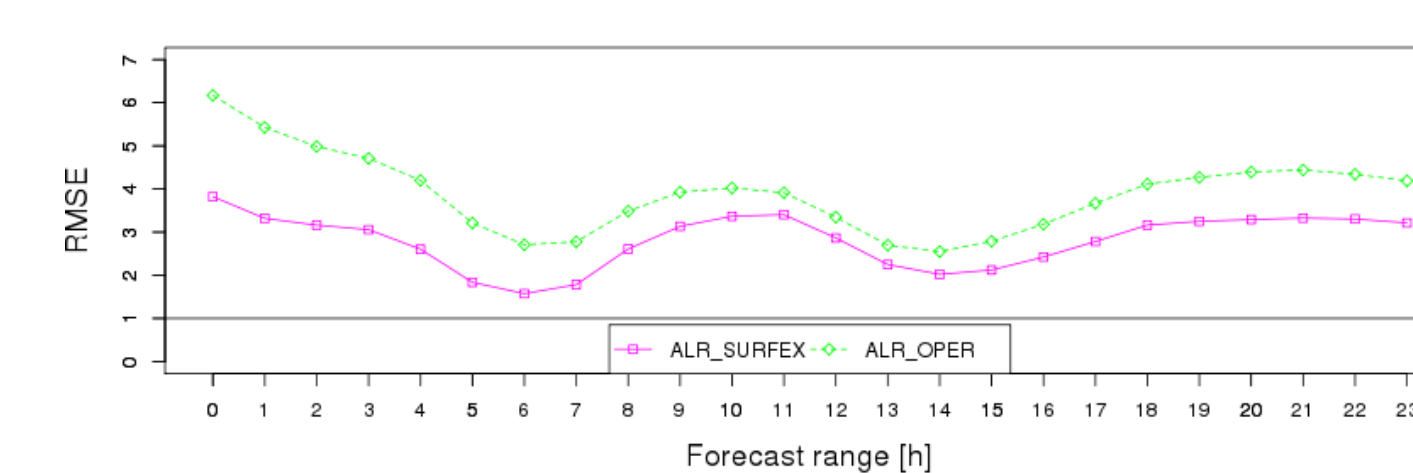
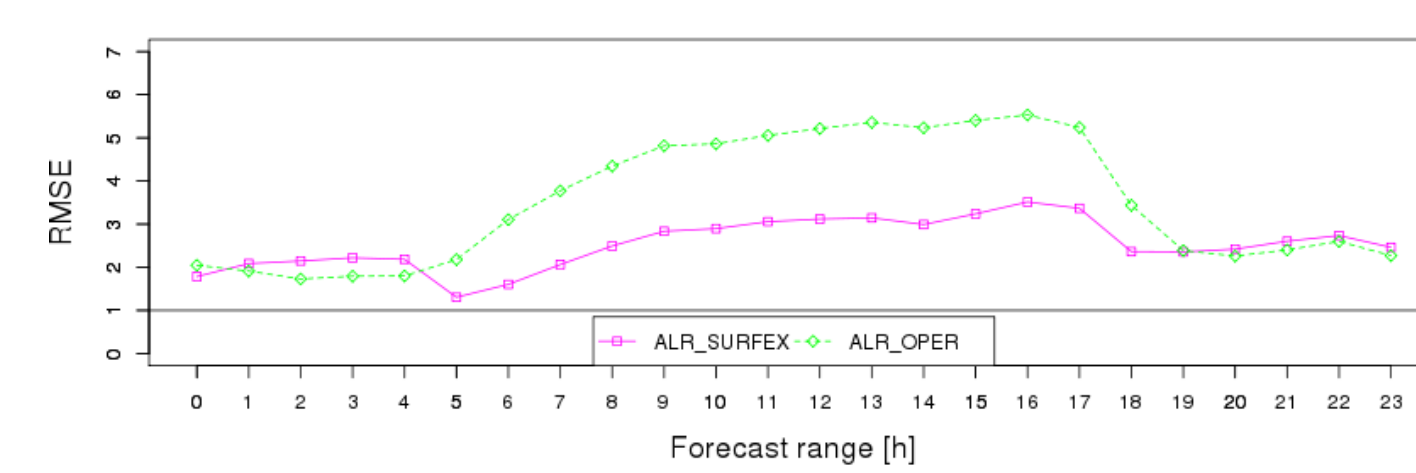
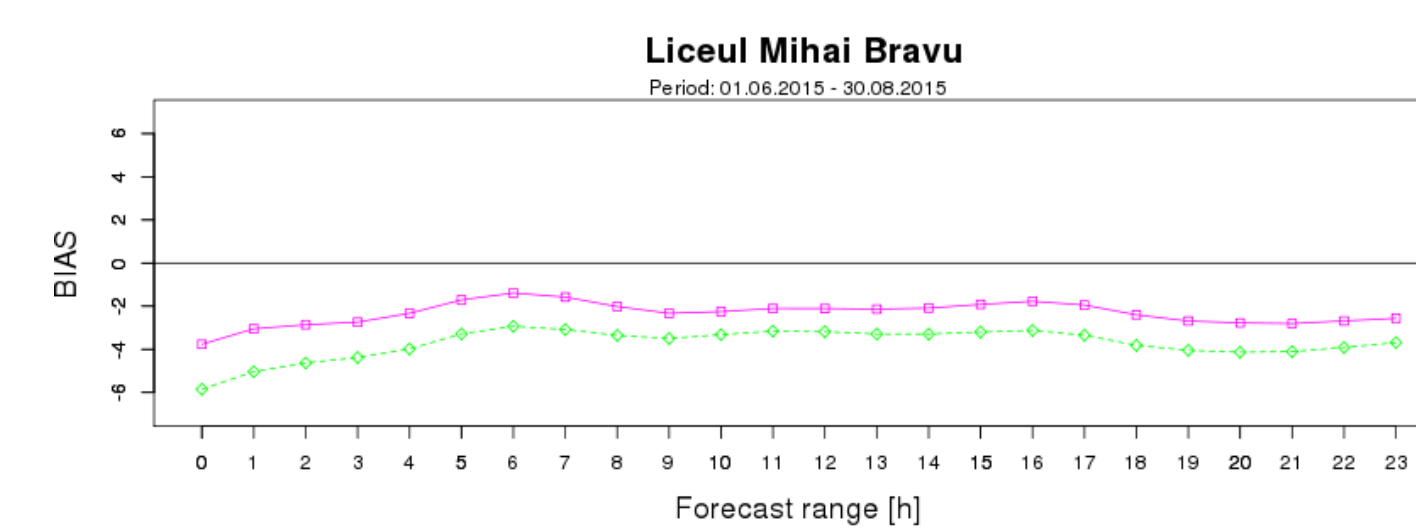
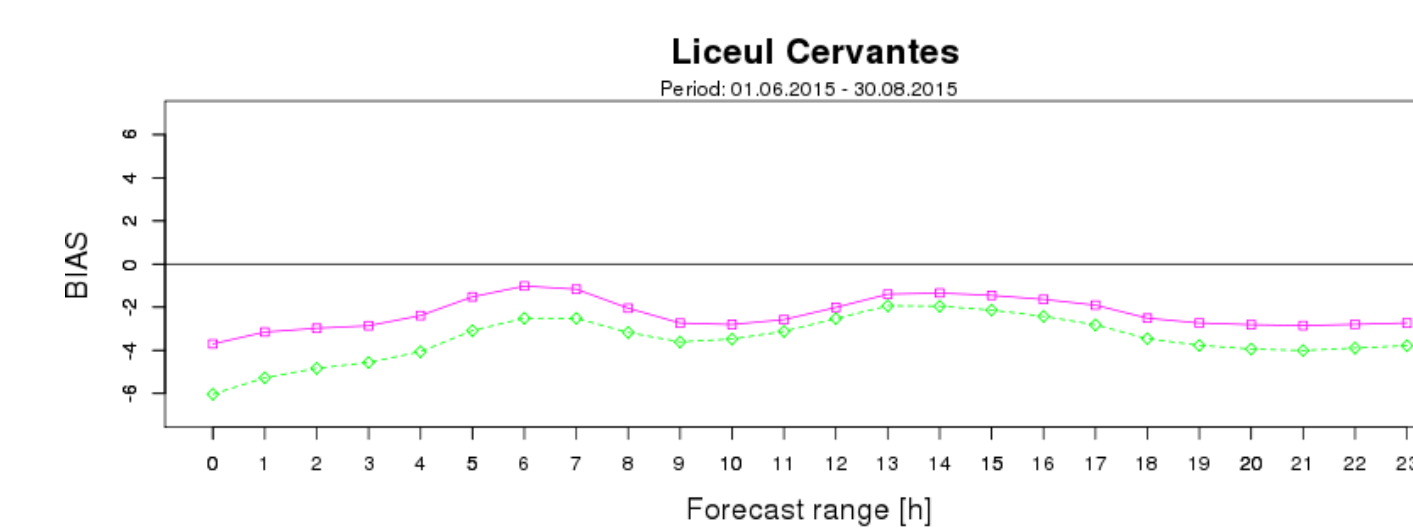
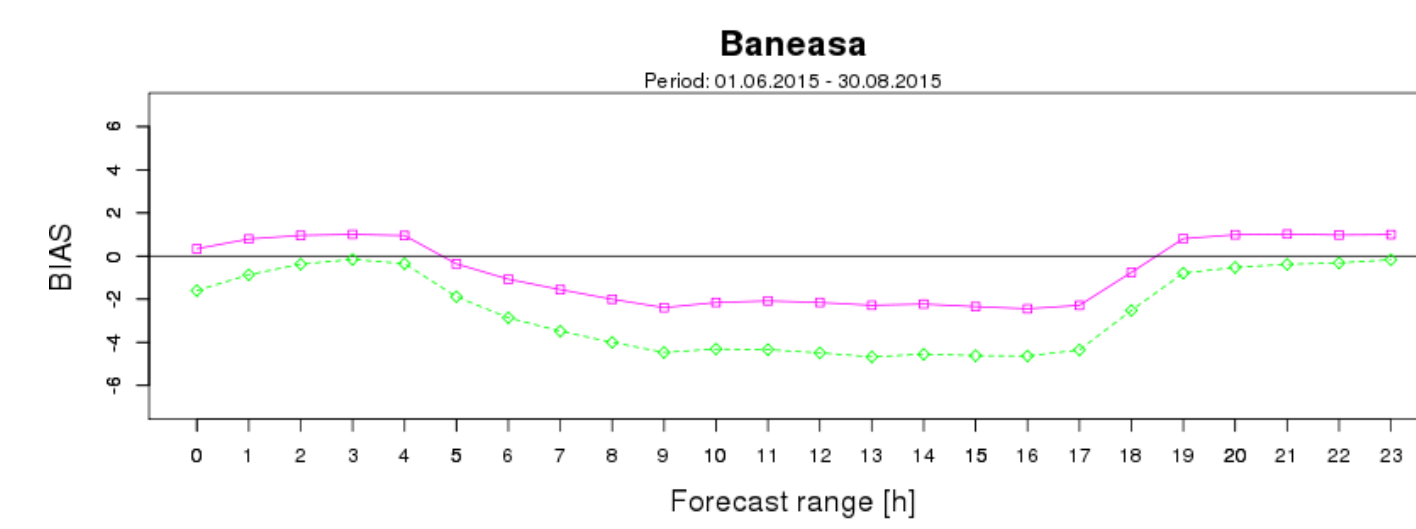
- simulated more realistic amounts of precipitation
- none of the versions captured the maximum observed quantity

• similar pattern

Testing ALARO coupled with SURFEX

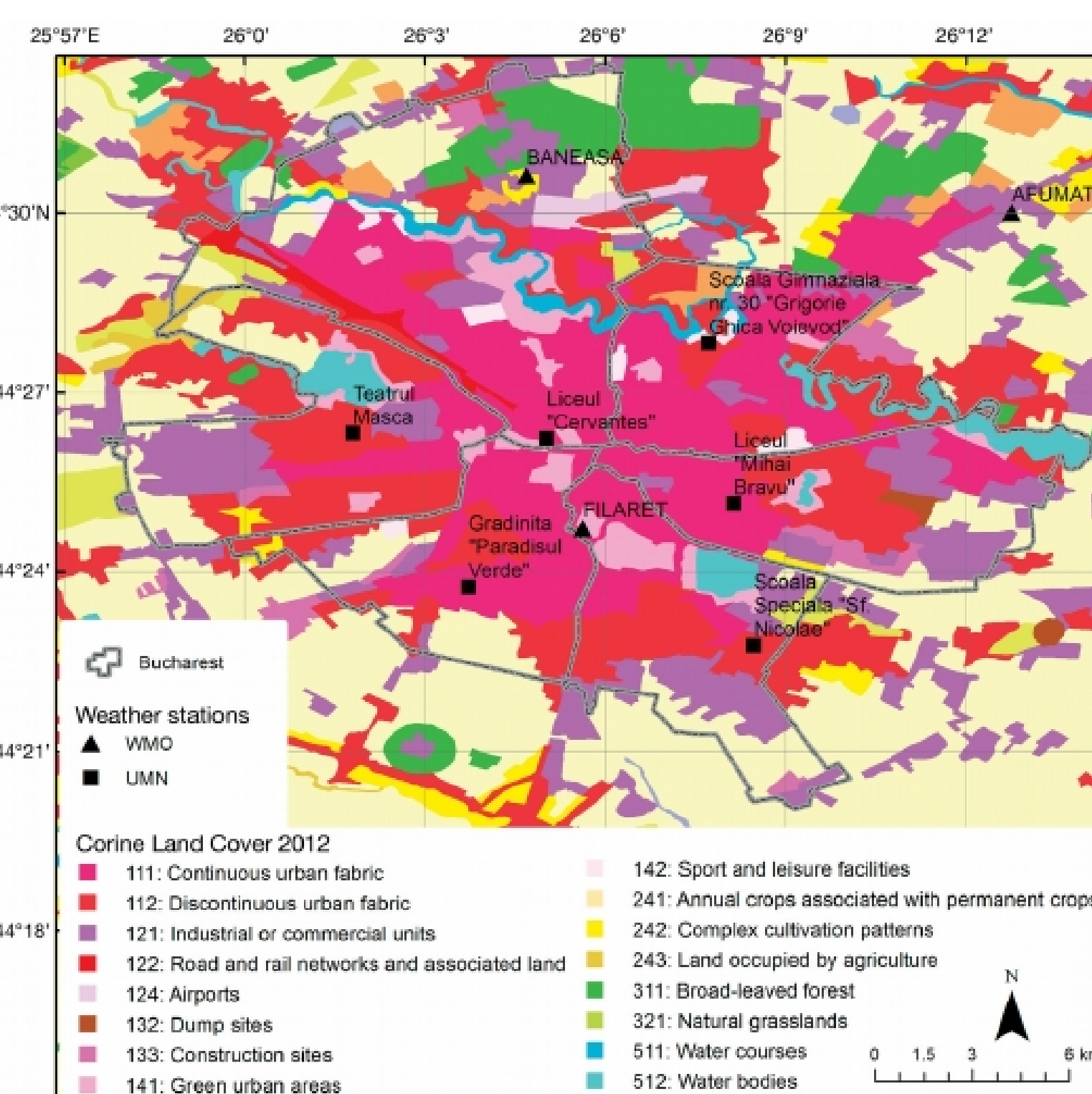
Verification for:

- 2m temperature
- 01.06 - 29.08. 2015 period
- ALARO - 0, cy36t1
- $\Delta x=4$ km, 200 x 200 points
- 40 vertical levels, Lambert projection
- Computed scores: BIAS+RMSE
- 3 synop stations + 6 automatic stations



ALARO-SURFEX version:

- leads to a better forecast of 2m temperature for all the urban stations
- for the rural stations Baneasa and Afumati the scores show less improvements during the night



Location of the synop/automatic stations - Bucharest area