



ALADIN in Poland

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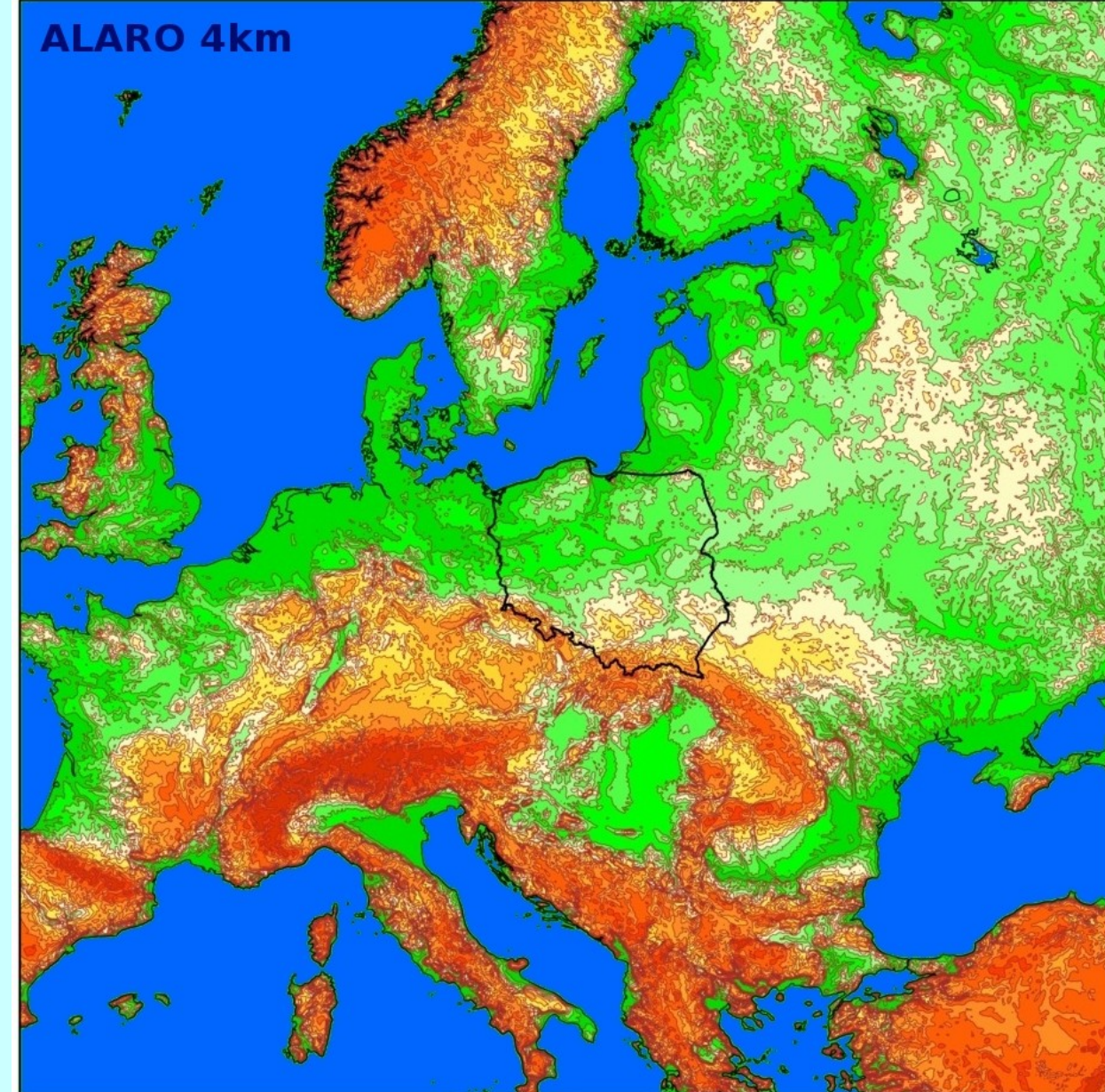
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OPERATIONAL

ALARO-1 (CY40T1) Operational Domain:

E040 domain:

- 4.0 km horizontal resolution,
- 789x789 grid points,
- 60 vertical model levels on a Lambert projection (3h coupling frequency and 3h output),
- coupling zone with 16 points,
- 4 runs per day (00,06,12 and 18 UTC),
- 66 hours forecast range,
- LBC from ARPEGE with 15.7km horizontal resolution.

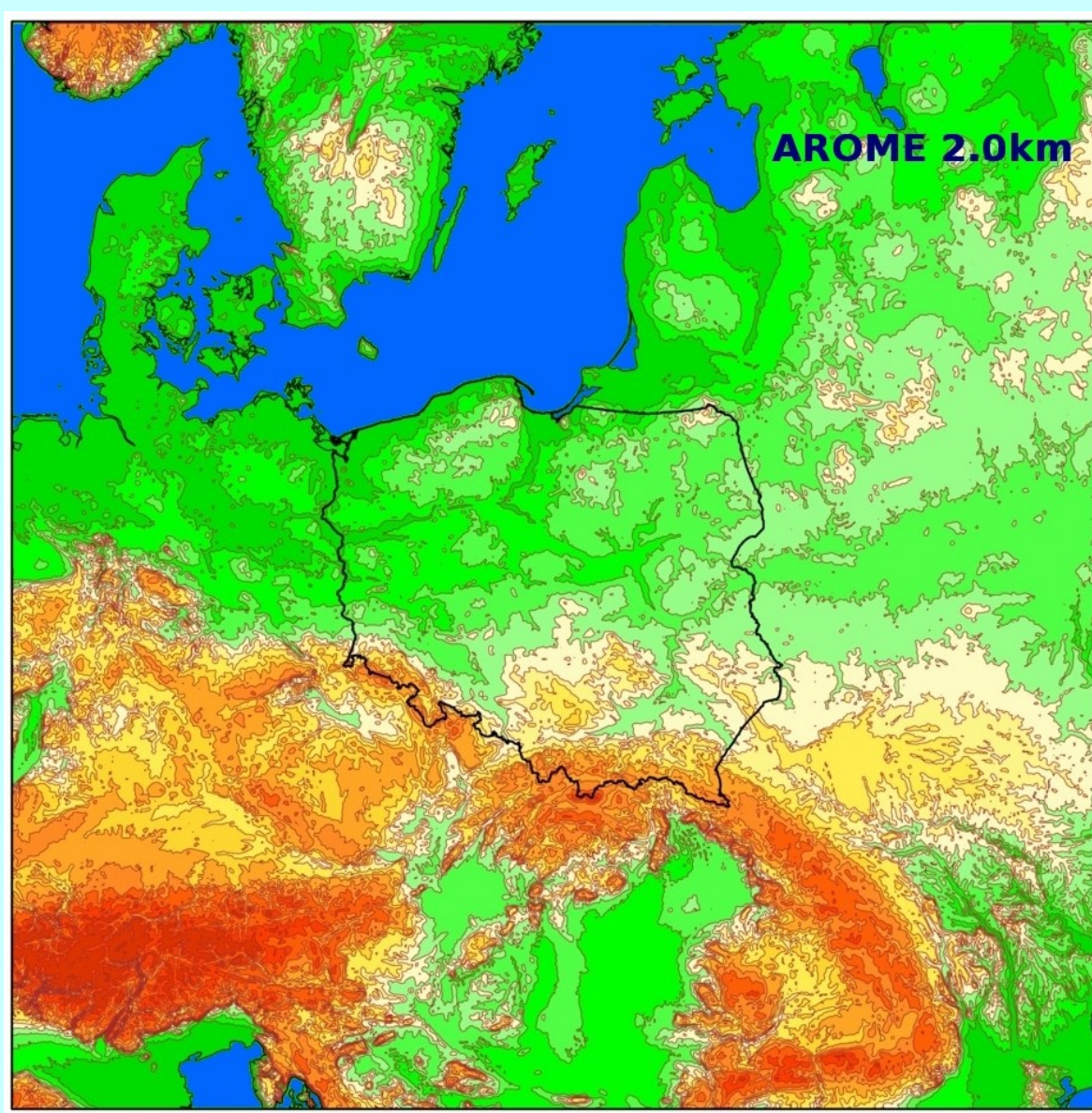


Operational machine characteristics

Cluster of HP BL460c_GEN8 servers connected with Infiniband network, OS Scientific Linux 6, Intel Xeon E5-2690 processors – with maximum 1536 cores (96 nodes with 16 cores each), each core RAM 128 GB, disc array – 60 TB.

Data assimilation

Surface data assimilation with CANARI is ready, and tests are in progress

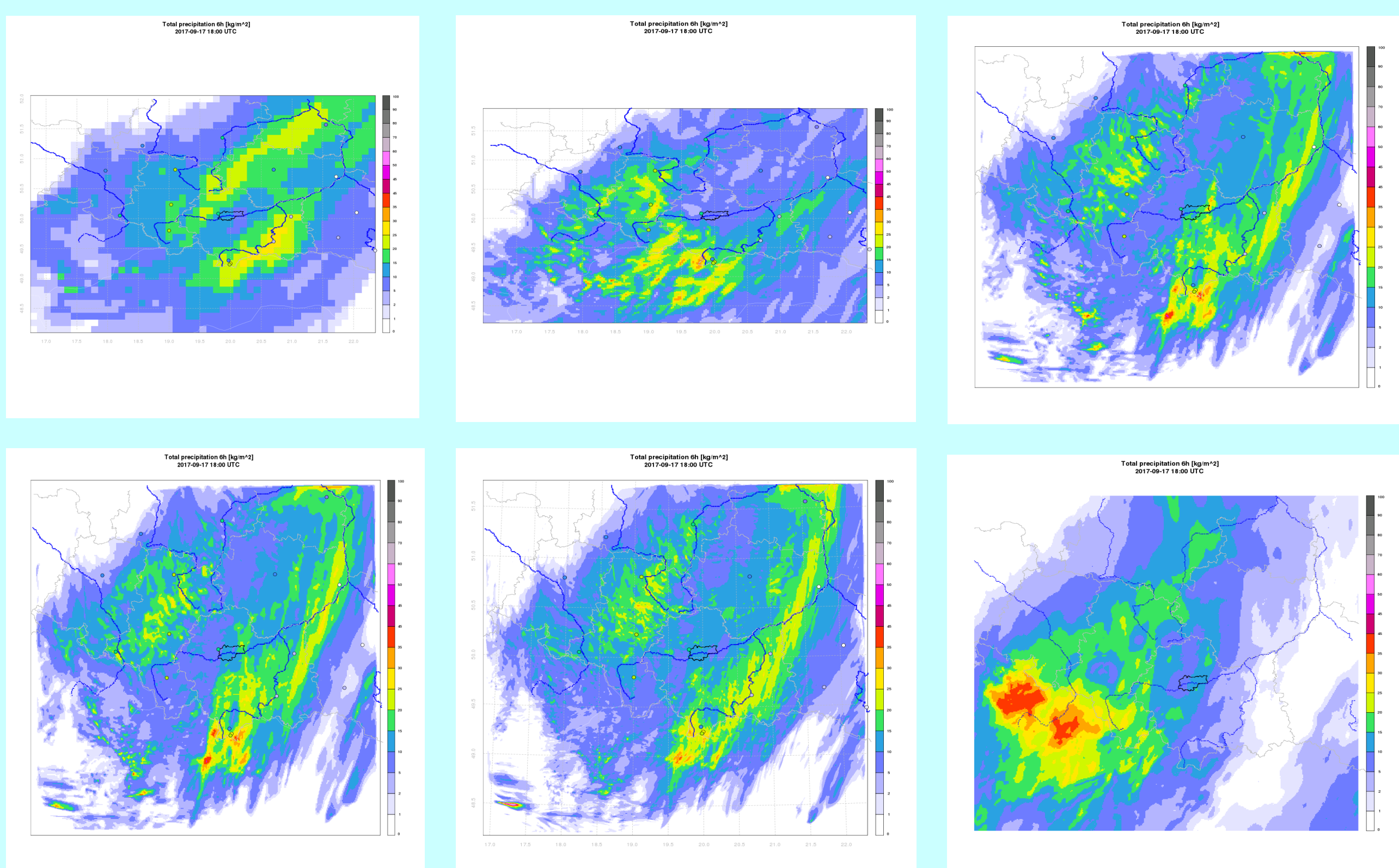


AROME Operational Domain:

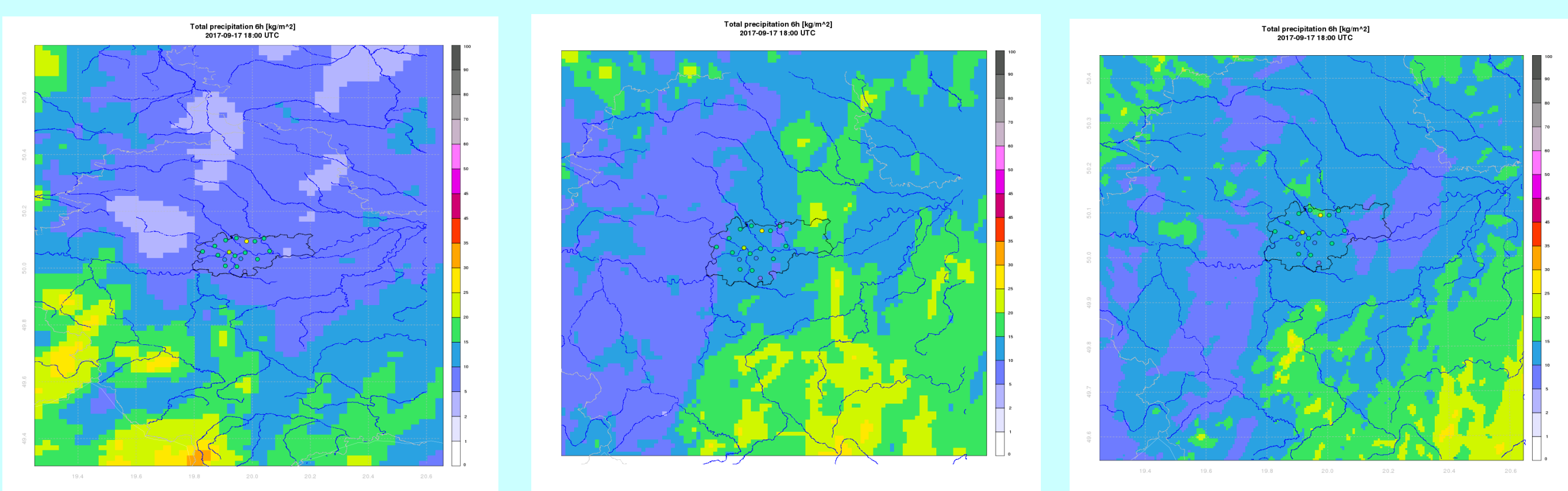
P020 domain:

- 2.0km horizontal resolution,
- 799x799 grid points,
- 60 vertical model levels on a Lambert projection (1h coupling frequency and 1 hour output),
- 4 runs per day (00, 06, 12 and 18 UTC),
- 30 hours forecast range,
- LBC from ALARO-1,
- GRIB format every 1h – for LEADS system.

AROME 500m and 1km



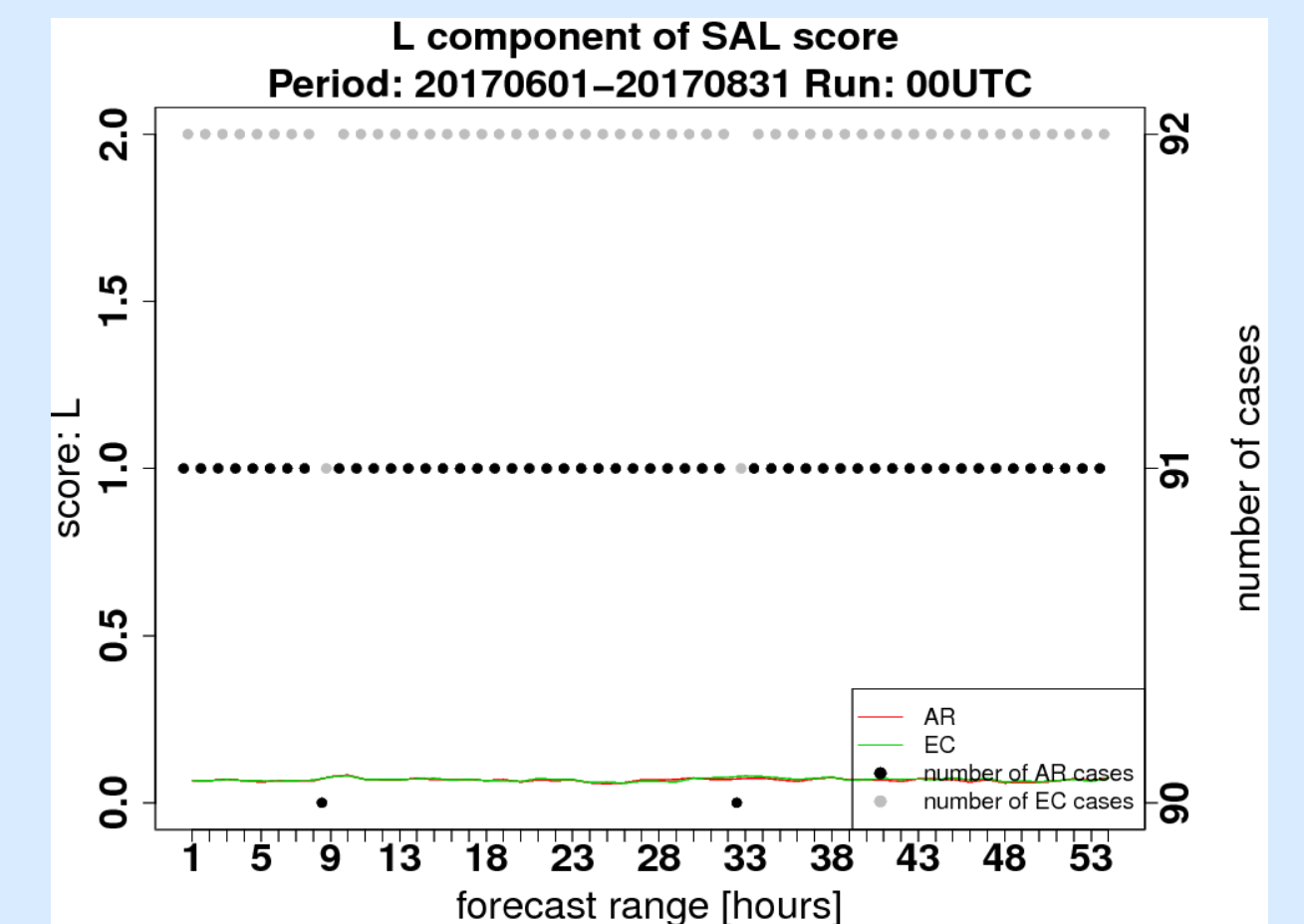
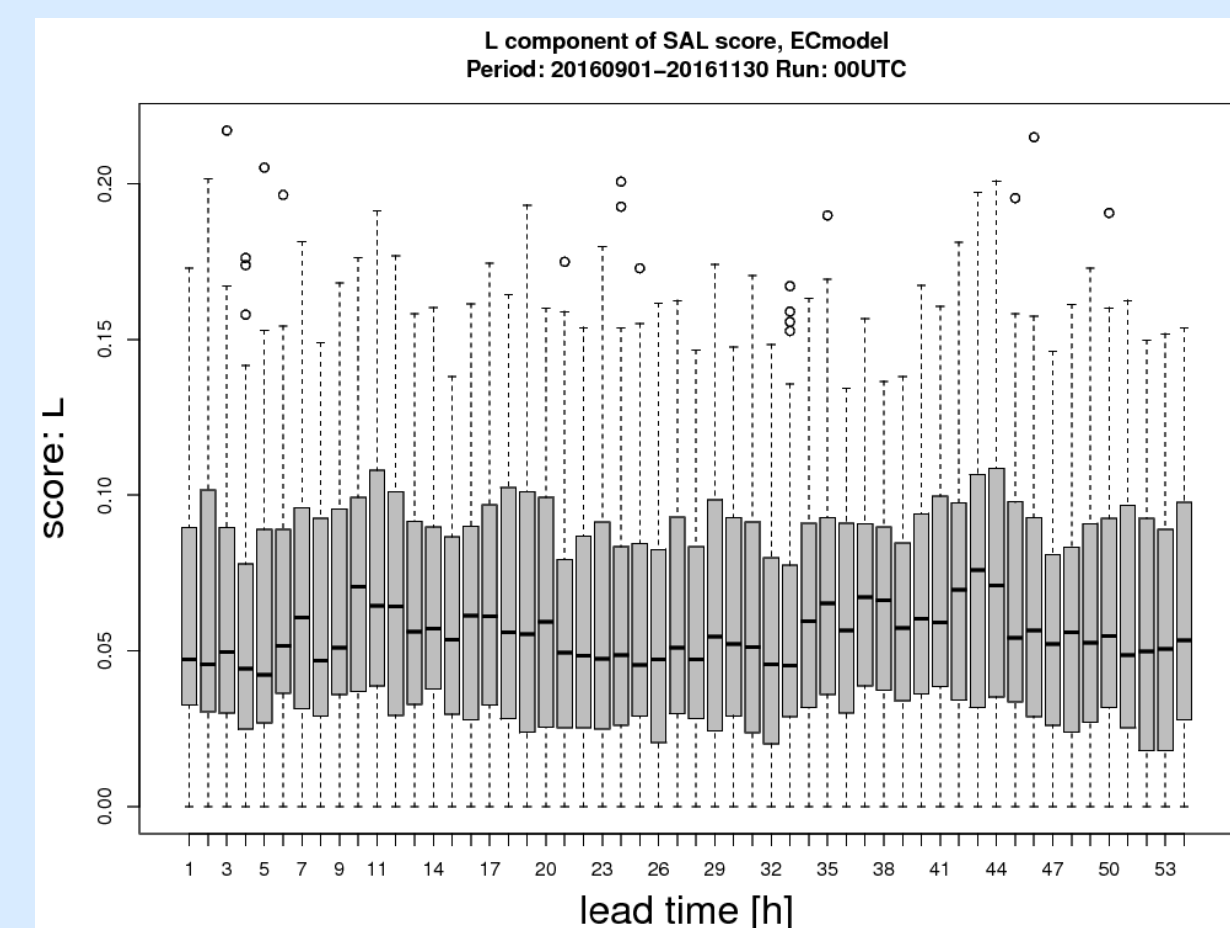
6h precipitation field. Results of high resolution models: upper left – ALARO-4km, upper middle – AROME-2km, upper right – AROME-1km (based on model with 60 levels), bottom left – AROME-1km (based on model with 105 levels), bottom middle – AROME-500m and bottom right – radar data. The differences are very small.



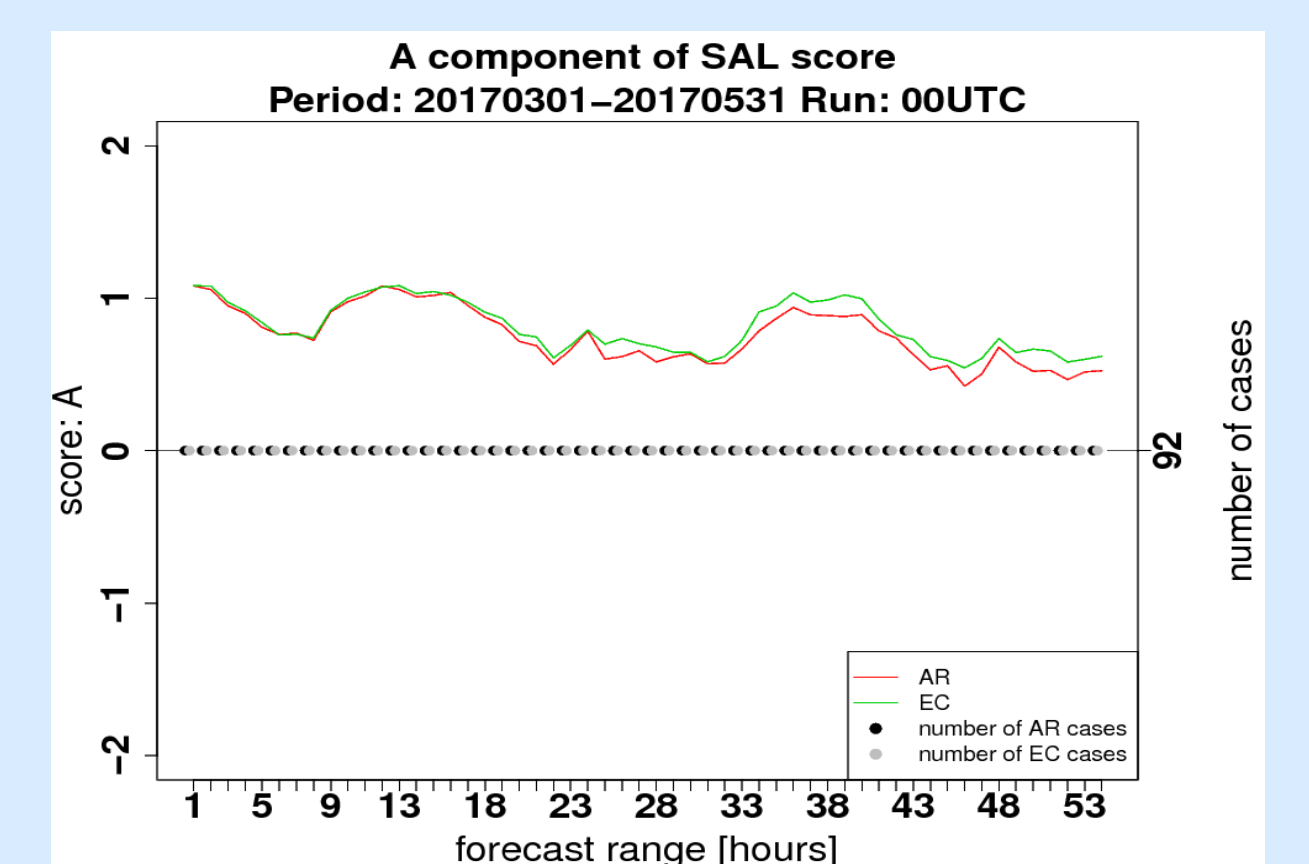
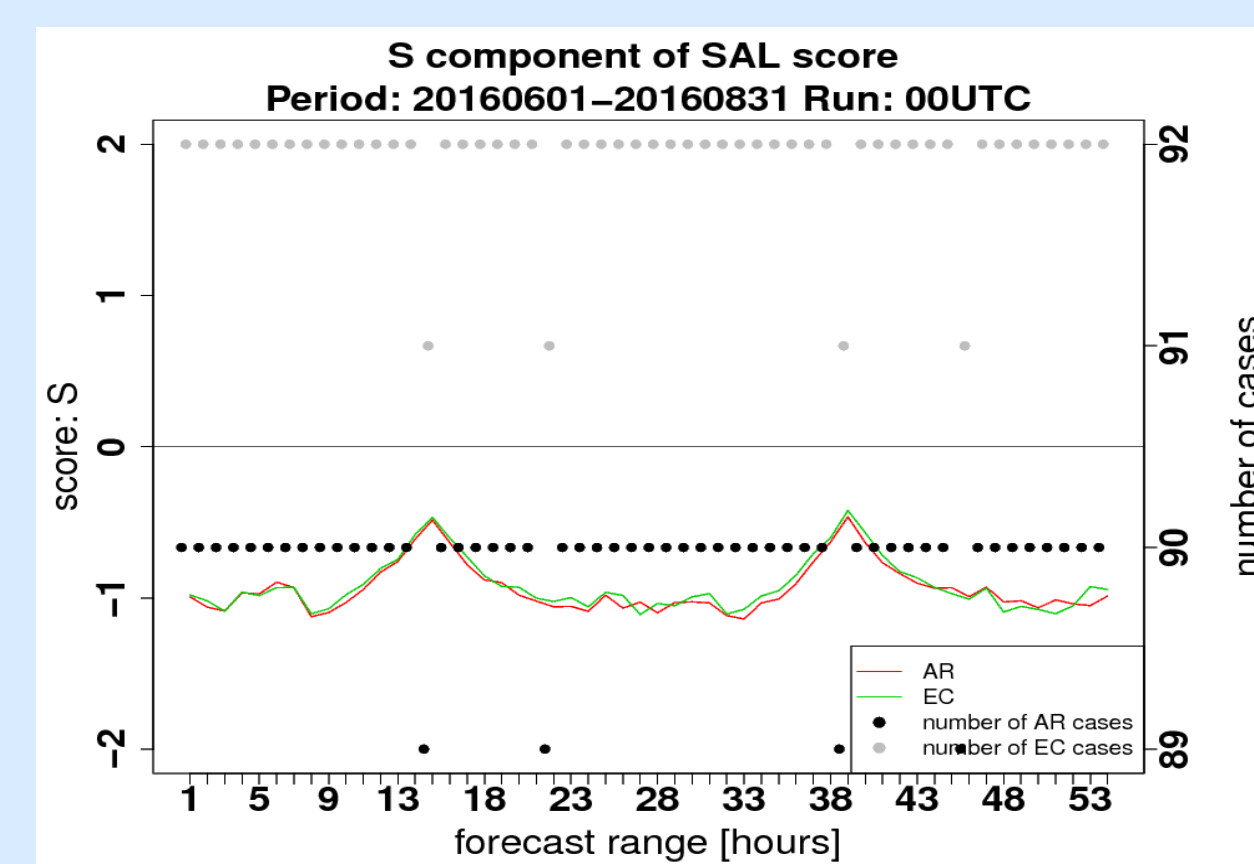
As above but for selected area (Malopolska district with Krakow county marked in black line polygon). Left – AROME 2km, middle – AROME 1km, right – AROME 500m. The radar field is better reproduced by AROME with higher spatial (both horizontal and vertical) resolution, especially by AROME 1km. The dots are for values from automatic stations of Municipal Water and Sewage Company in Krakow, color scale corresponding to surrounding map, rivers are marked blue.

SAL report

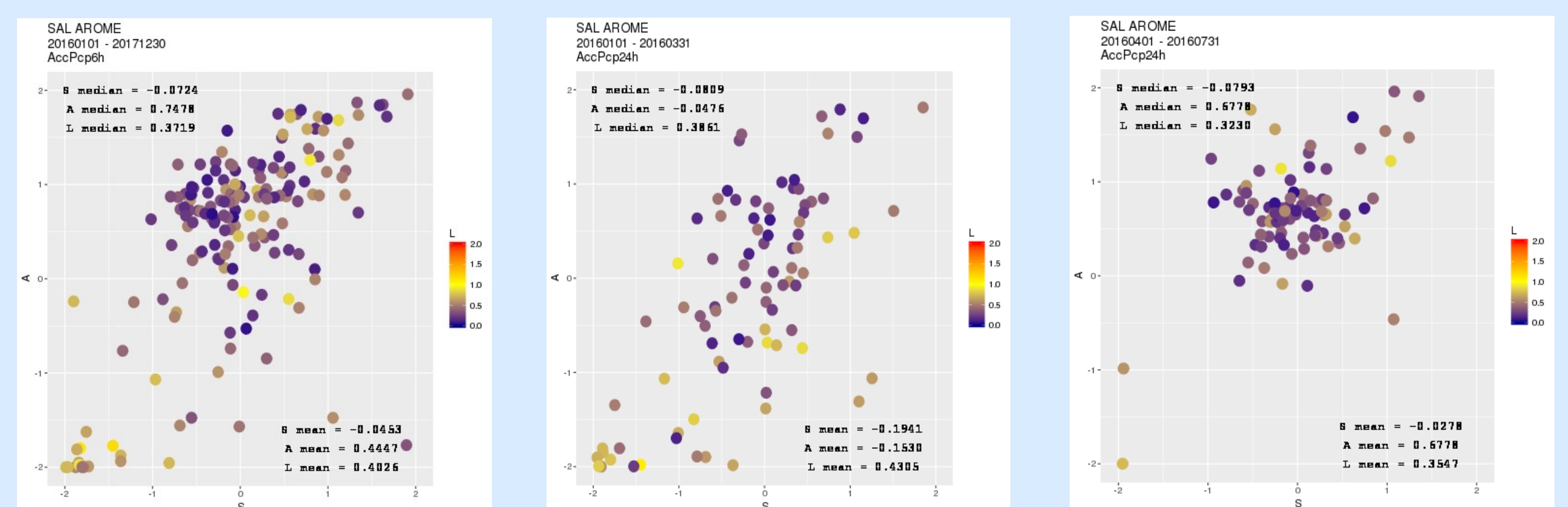
SAL score consists of three factors: structure (S), amplitude (A) and localization (L). The combination of these three indexes may have informative function how model interacts with observation, and how observation reflects model predictions.



Above left – boxplot showing L index distribution. Above right – L index of SAL for season 2017 (91 days), for the forecast with different coupling files, ARPEGE (AR) and ECMWF (EC) for Slovenian domain.

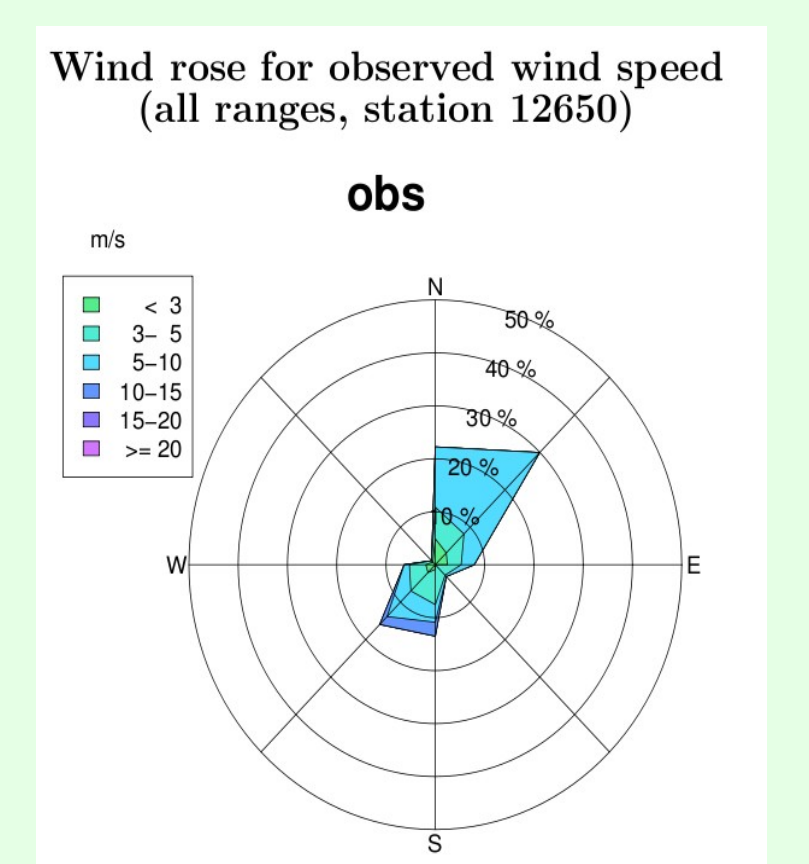
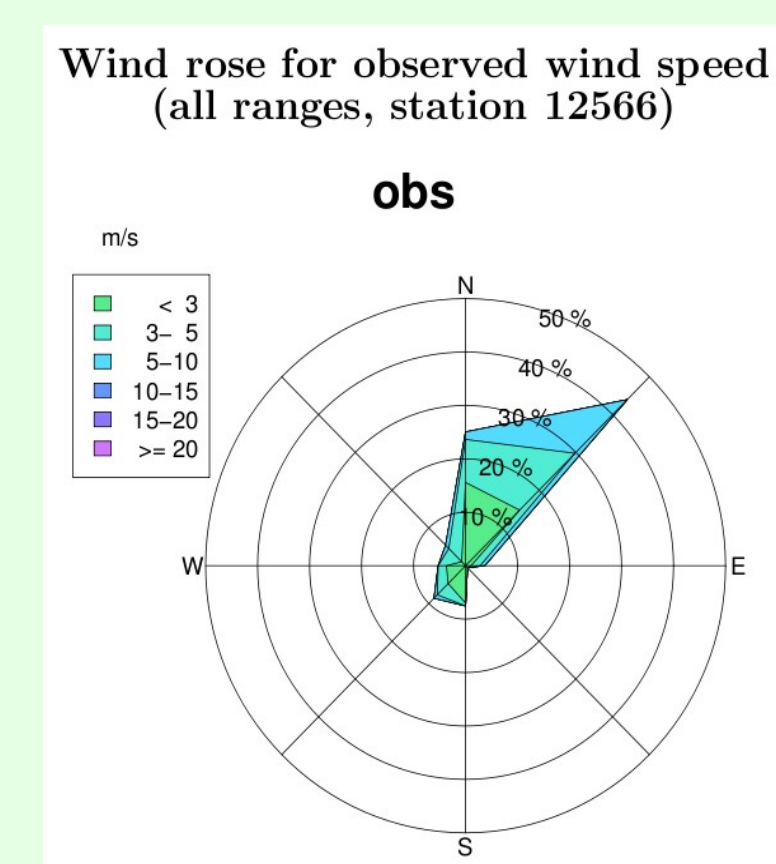
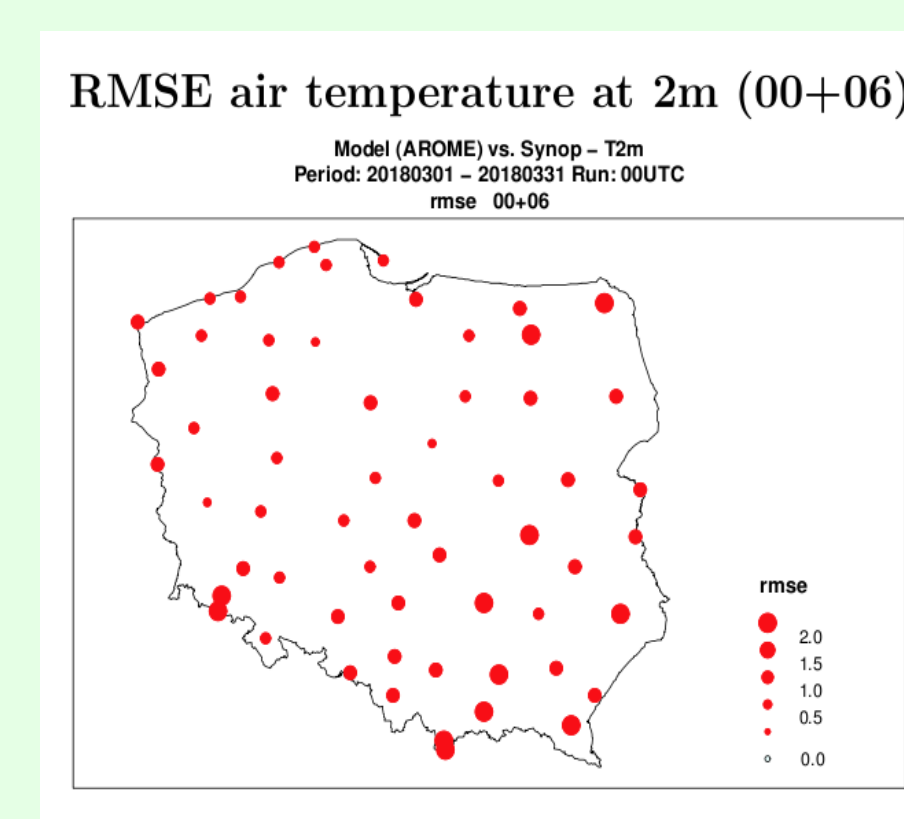
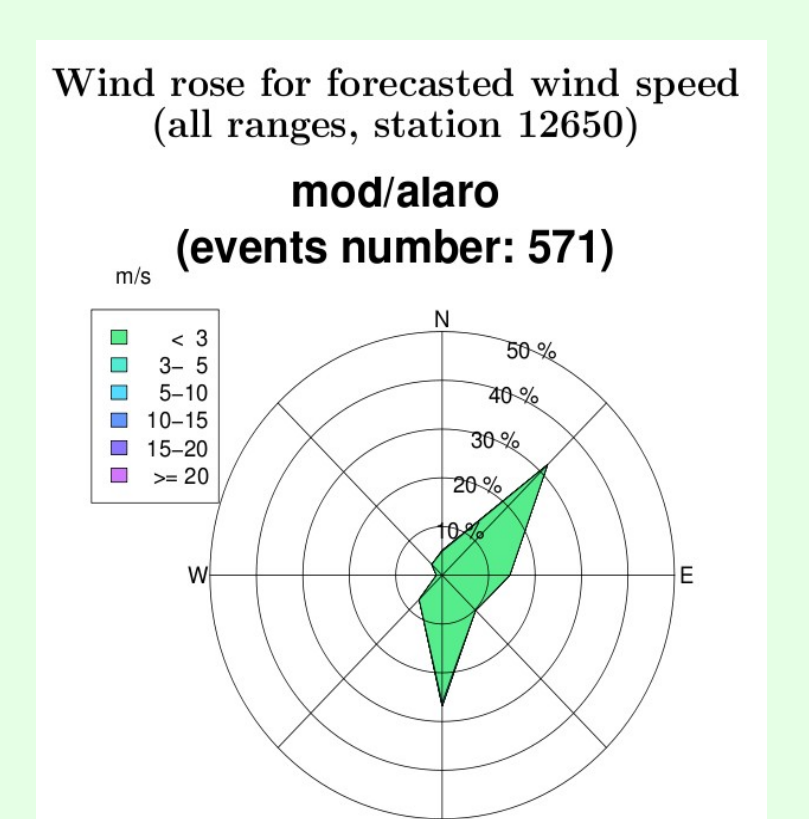
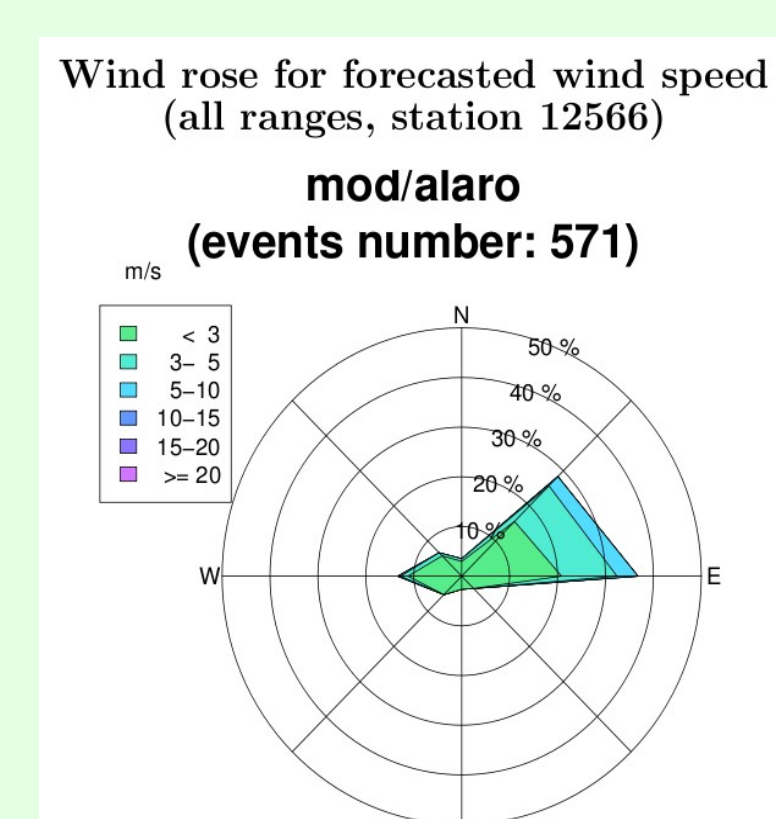
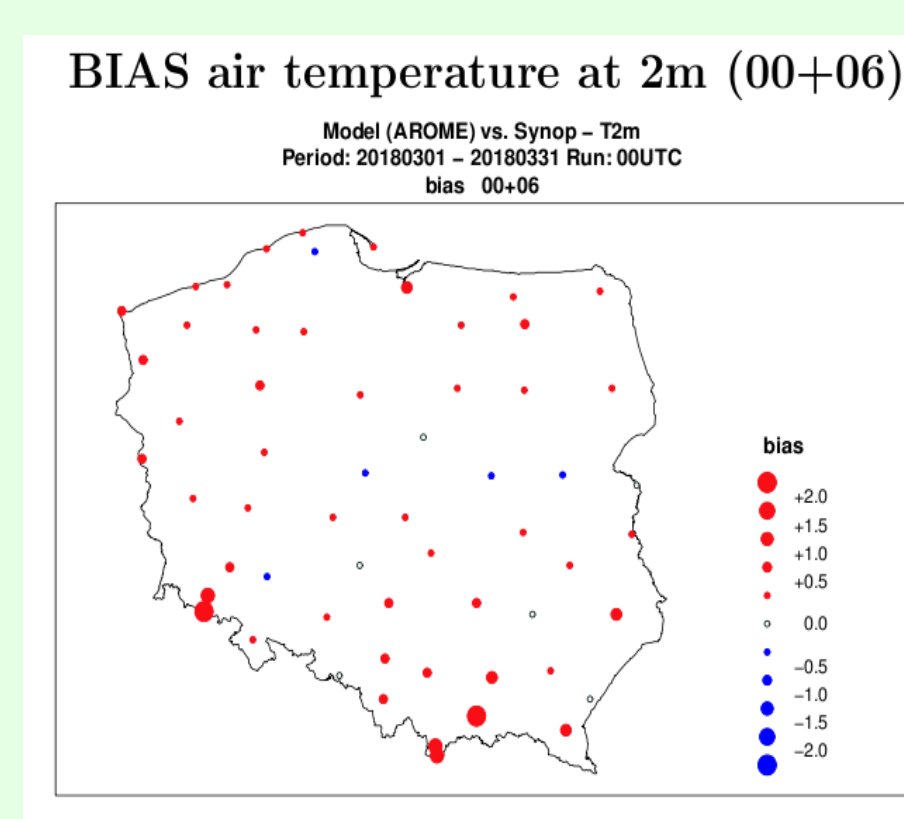


S (left) and A (right) indexes for seasons: summer 2016 (left) and spring 2017 (right), for AR – ARPEGE and EC – ECMWF couplings for Slovenian domain.



Scatterplots for SAL (AROME Poland) for precipitation accumulations: 6h (left) and 24h (middle and right). The reference data is based on RainGRS – combination of radar, satellite and surface rain stations. It is easily seen that the best structure and amplitude of prediction of precipitation are for spring (right) while the worst one is for winter (middle).

Verification reports



Verification diagrams (ALADIN PL) cover BIAS (upper left) and RMSE (lower left) of temperature predicted by AROME and windroses for mountain station Kasprowy Wierch (12650) ALARO prediction upper right and for observation (lower right) and Kraków (12566) ALARO prediction upper middle and for observation lower middle.