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ALADIN activities in Romania

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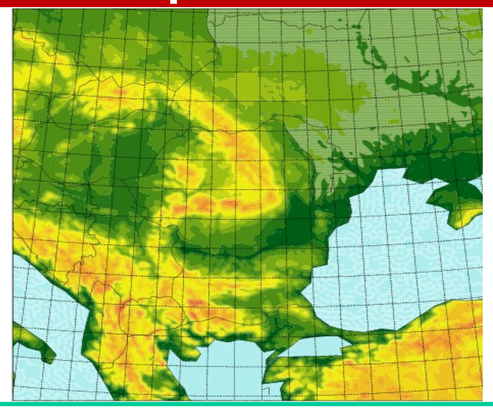
ALARO Operational Suite



Characteristics

- cy40t1 – **ALARO-0 baseline**;
- semi-implicit semi-Lagrangian 2TL, Δt=240 s;
- Δx=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

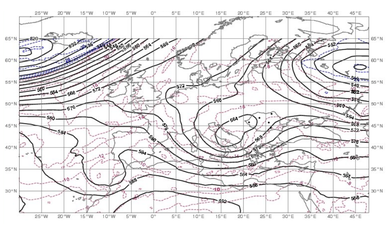
- Graphics based on package developed within NMA and RC-LACE, based on grib_api, perl and NCL-NCAR

Statistical Adaptation Verification

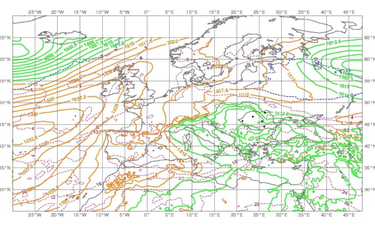
Case study: 19.09.2016 - Testing ALARO-1vA version

- the operational model:
  - led to much smaller amounts of precipitation in the southern part of the country with respect to the observations
  - simulated large, unrealistic amount of precipitation in the eastern part

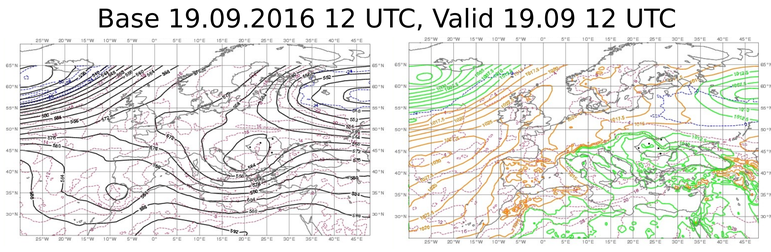
T+Z500 hPa ARPEGE



MSLP + T850 hPa ARPEGE



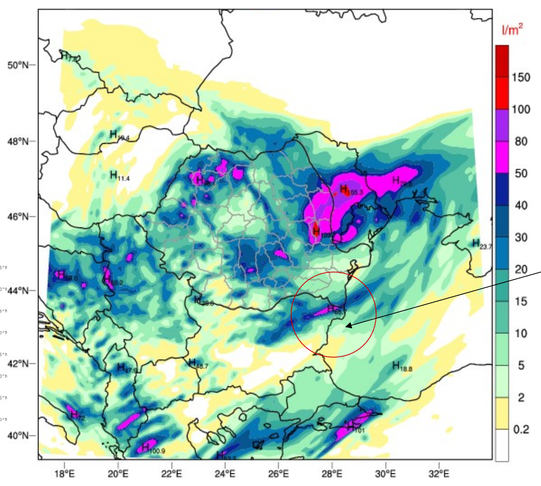
Base 19.09.2016 12 UTC, Valid 19.09 12 UTC



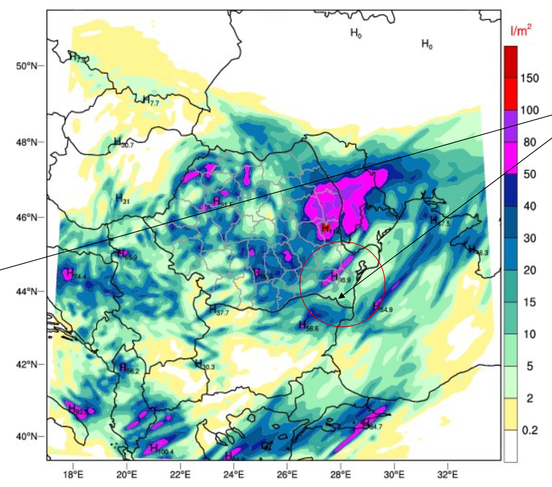
Base 19.09.2016 18 UTC, Valid 19.09 18 UTC

- intense cyclonic activity over South-Eastern Europe, leading to increased atmospheric instability

24h cumulated precipitation, 19.09.2016 – 20.09.2016, 06 UTC



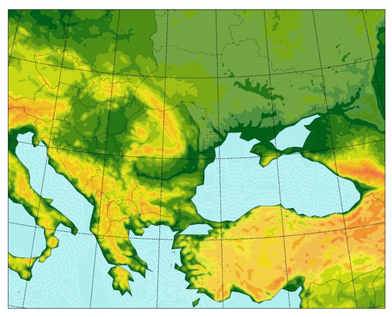
ALARO-0 OPER



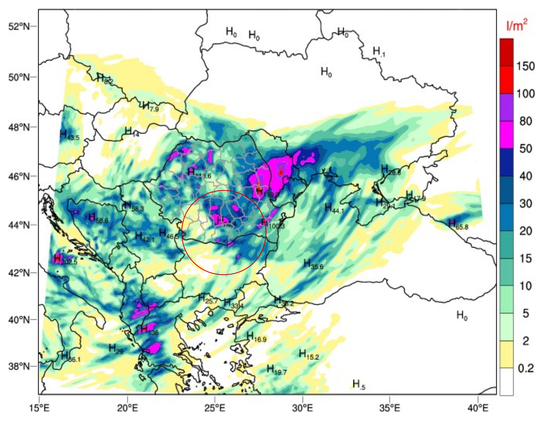
ALARO–1

- ALARO-1 led to a shift of the precipitation belt which can be seen in the ALARO- operational forecast outside the southern border of the country => better forecast for heavy precipitation

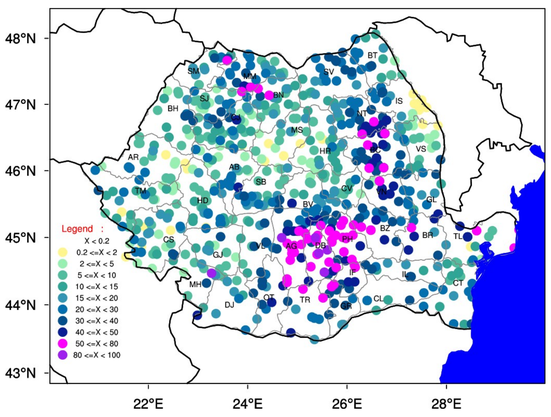
operational domain



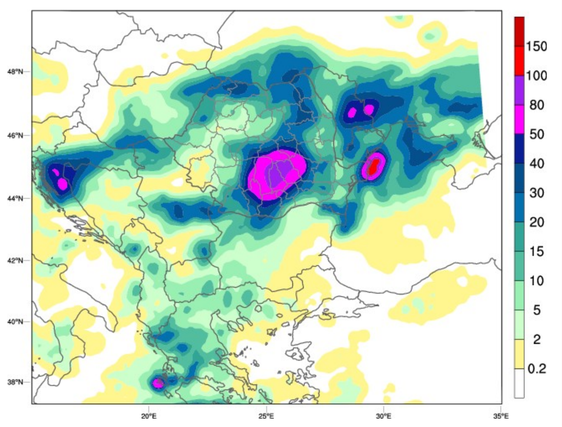
SELAM domain



ALARO–1 (SELAM domain)

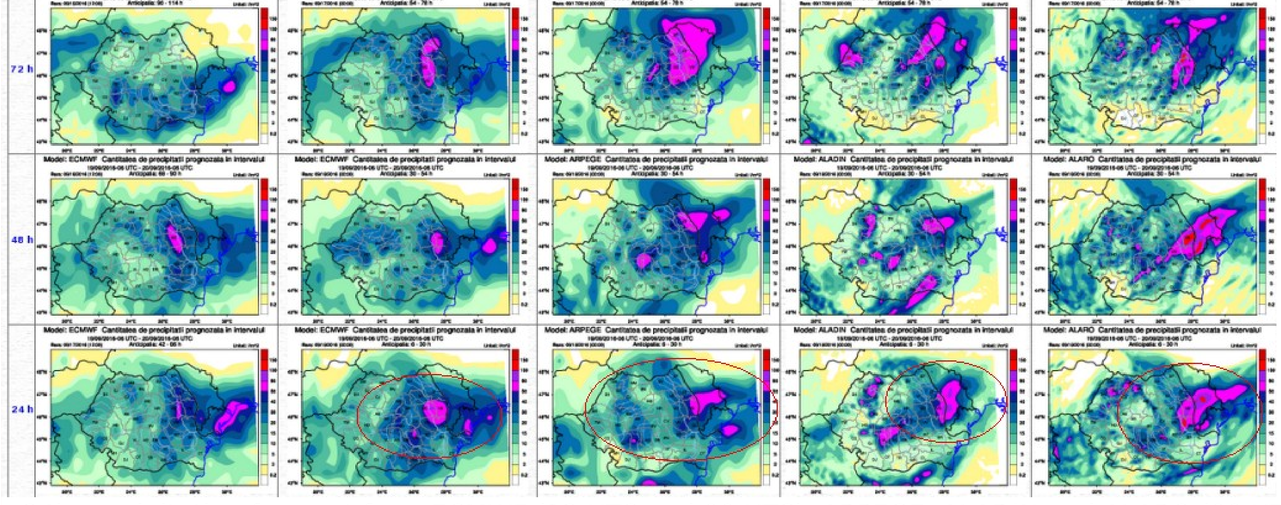


Observations

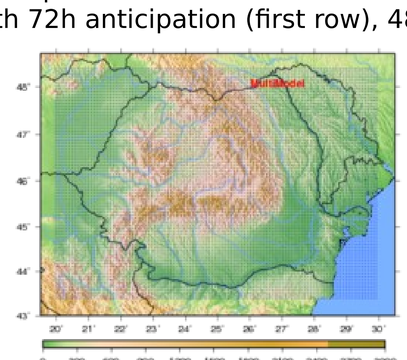


Global Satellite Mapping of Precipitation (JAXA)

- increasing the integration domain (including the Black Sea) generates a bigger amount of precipitation in the southern part => beneficial for precipitation forecast

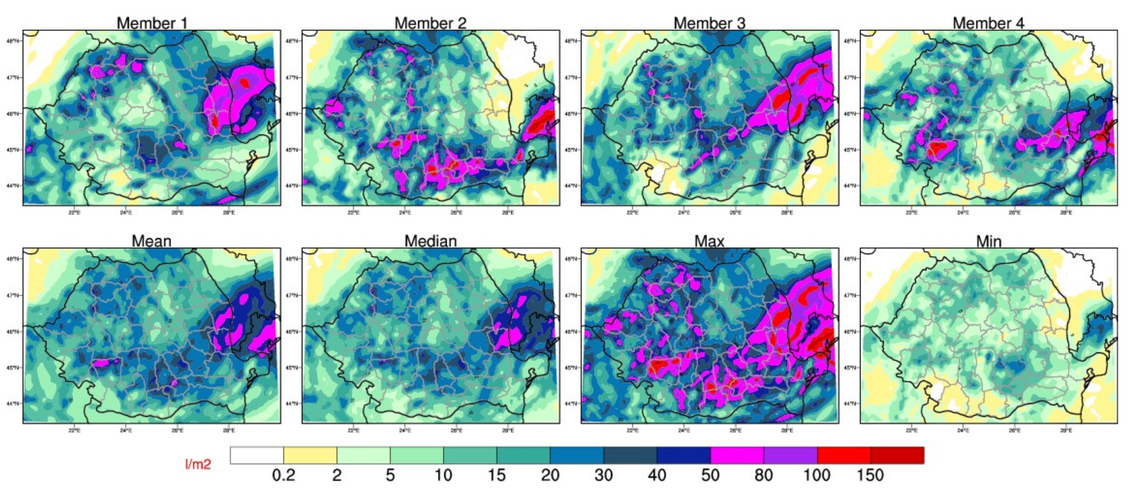


24h precipitation forecast from ECMWF (12 UTC and 00 UTC), ARPEGE, ALADIN and ALARO (00 UTC), with 72h anticipation (first row), 48h anticipation (second row) and 24h anticipation (last row)



MULTI-MODEL domain

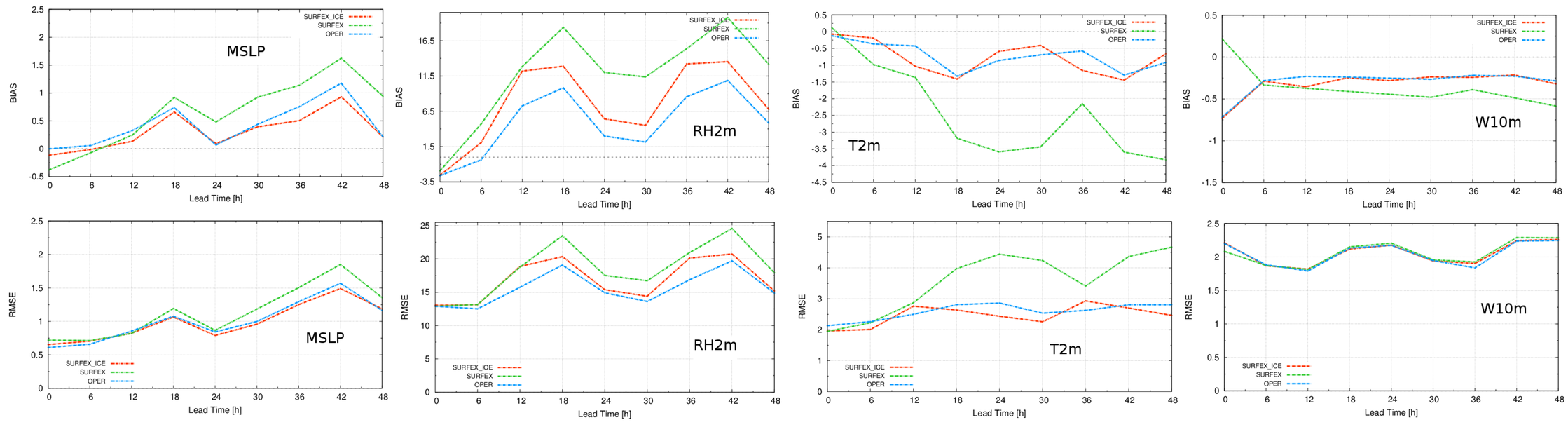
COSMO - 00 UTC (previous day):										
member 4 -	00	06	12	18	24	30	36	42	48	54
ALARO - 00 UTC (previous day):										
member 3 -	00	06	12	18	24	30	36	42	48	54
COSMO - 00 UTC (current day):										
member 2 -					00	06	12	18	24	30
ALARO - 00 UTC (current day):										
member 1 -					00	06	12	18	24	30



MULTI-MODEL forecast

- the maximum values gave a signal of the intensity of the event

Testing ALARO coupled with ARPEGE+SURFEX - Verification for 01-10.04.2017 period



- for T2m, MSLP, the operational ALARO outperforms the ALARO coupled with ARPEGE-SURFEX
- following François Bouyssel's suggestion by removing deepsoil ice where deepsoil temperatures are positive (applying Daan Degrauwe's programs), an improvement can be seen