

ALARO - Romania

Computing platform:

❖ IBM BLADE Linux Cluster

- 14 nodes; 2 CPU-quad core / node; x86_64 processor architecture, 2.5 GHz Red Hat 5.3 Enterprise
- 6 nodes quad-core dedicated to ALARO

Model

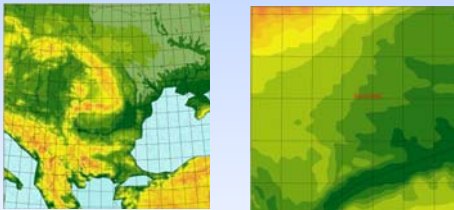
➤ version: cy35t1

➤ Characteristics

- hydrostatic version
- semi-implicit semi-Lagrangian two-time-level scheme; $\Delta t=240$ s
- 4 runs / day 00, 06, 12 18 \Rightarrow 78, 54, 66, 54 hrs forecast range
- boundary conditions from ARPEGE (3 hrs coupling frequency)
- domain: 240 x 240 points, $\Delta x=6.5$ km (Lambert Projection - linear grid) 49 vertical levels
- physical parameterizations : standard ALARO-0 set up
 - prognostic variables for water species
 - pseudo-prognostic TKE scheme
 - radiation: NER for thermal band
 - surface ISBA schem
 - 3MT frame for moist [processes]

➤ Post-processing and visualization

- in line FPOS on a geographical regular grid (0.1 x 0.125°) and of line in model grid, hourly up to 54 forecast range, every 3 hrs afterwards
- grib format ;
- new graphics based on Magics \rightarrow ALARO intranet web site



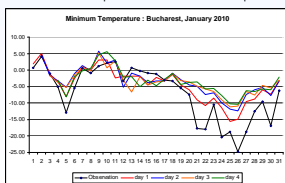
ALARO domains and orography

ALARO- evaluation in respect with the ALADIN model ($\Delta x=10$ km)

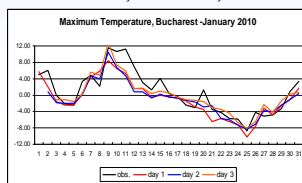
- **Precipitation**
 - better precipitation structure (noise is remove)
 - better position and evolution of the precipitation bands
 - generally better precipitation amount
- **Wind**
 - better direction and position of high speed areas
 - better evolution of the wind field
 - better maximum wind speed even if it is still underestimate for strong wind

• Temperature

- there is still a problem for the minimum temperature for the situations with clear sky and fresh snow layer



Day1: mean error = 2.46°C



Day1: mean error 1 = -1.54 °C

Minimum and maximum temperature for January 2010

ALARO - Bucharest

- ❖ Atmospheric input for urban scale (Bucharest) air quality forecast system
 - to be coupled with MOCAGE (MACC project) -

➤ Same platform as for ALARO Romania

➤ Same model characteristics like ALARO Romania but non-hydrostatic version, $\Delta t=45$ s

➤ domain covering Bucharest area

- 80 x 80 points (Lambert Projection – linear grid) $\Delta x = 2$ km
- 60 vertical levels

➤ 1 run / day 00 \Rightarrow 24 h forecast range

➤ boundary conditions from ALARO-Romania (1 h coupling frequency)

ALADIN

- ❖ Still alive for downward applications

Computing platform:

- SUN E4500 workstation (8-CPU 400GHz, 8*1 GB RAM) for direct integrations and in line post processing
- ALPHA DEC 500 workstation (1CPU, 704 MB RAM) for off line post processing

Model

➤ version: cy28t3

➤ physical parameterizations : quite simple in respect to last developments

➤ boundary conditions from ARPEGE: 6 hour coupling frequency

ALADIN-ROMANIA

domain: covering Romania and surroundings

144 x 144 points (Lambert Projection – quadratic grid), $\Delta x=10$ km
41 vertical levels

\rightarrow atmospheric input for hydrological models

ALADIN-Selam

domain: covering entire Black Sea

120 x 90 points (Lambert Projection – quadratic grid), $\Delta x=16$ km
46 vertical levels

\rightarrow atmospheric input for Black Sea applications

SHORT RANGE PEPS – operational for 24h cumulated precipitation

built using 3 different forecast models:

ALADIN : $\Delta x=10$ km

COSMO : $\Delta x=14$ km

HRM : $\Delta x=28$ km

• run 00 UTC

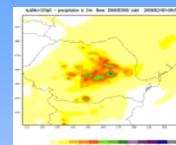
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ALADIN 00 UTC	0	6	12	18	24	30	36	42	48	54	60	66	72	78
HRM 00 UTC	0	6	12	18	24	30	36	42	48	54	60	66	72	78
COSMO 00 UTC	0	6	12	18	24	30	36	42	48	54	60	66	72	78
ALADIN 00 UTC	0	6	12	18	24	30	36	42	48	54	60	66	72	78
HRM 00 UTC	0	6	12	18	24	30	36	42	48	54	60	66	72	78
COSMO 00 UTC	0	6	12	18	24	30	36	42	48	54	60	66	72	78
ALADIN 00 UTC	0	6	12	18	24	30	36	42	48	54	60	66	72	78
HRM 00 UTC	0	6	12	18	24	30	36	42	48	54	60	66	72	78
COSMO 00 UTC	0	6	12	18	24	30	36	42	48	54	60	66	72	78

24 h cumulated precipitation Observations
Valid 31.08.2009, 06 UTC



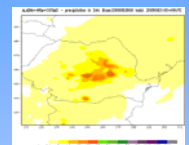
ALADIN

PEPS average ALADIN + COSMO

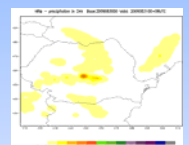
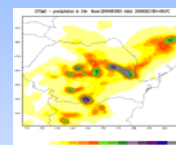
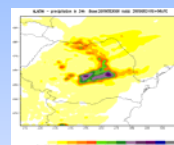


COSMO

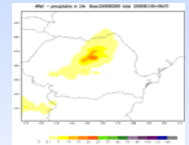
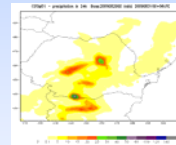
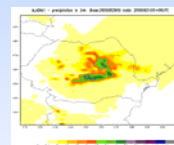
PEPS average ALADIN + COSMO + HRM



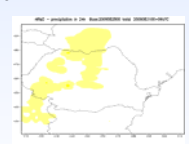
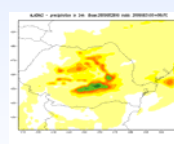
HRM



24 h cumulated precipitation : 30 h forecast range



24 h cumulated precipitation : 54 h forecast range



24 h cumulated precipitation : 78 h forecast range

- The precipitation pattern is better simulated by the PEPS average
- The precipitation local maximum over Carpathians is:
 - overestimated by ALADIN
 - underestimated by HRM
- COSMO is the only one model simulating the local maximum over the Southern Romania

Generally the PEPS average performs better than any individual member !