33th EWGLAM&18th SRNWP Meetings - Estonia, 10th to 13th October, 2011

Meteo Romania

LAM ACTIVITIES IN ROMANIA

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A. ALADIN/ALARO applications

D. BANCIU, M. PIETRIŞI, S. TAŞCU

Operational suite

ALARO model: cy35t1

- 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

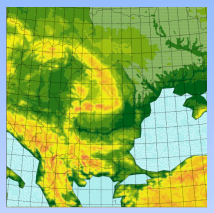
➢ Characteristics

- ❑ semi-implicit semi-Lagrangean two-time-level scheme
- ❑ projection: Lambert Projection - linear grid
- ❑ physical parameterizations : standard ALARO-0 set up
  - prognostic variables for water species
  - pseudo –prognostic TKE scheme
  - radiation: NER for thermal band
  - surface ISBA scheme
  - 3MT frame for moist processes

➢ Post-processing and visualization

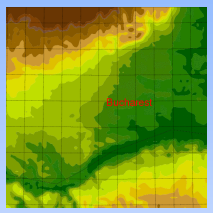
- ❑ in line FPOS on a geographical regular grid (0.1 x0.125°) and of line
- ❑ in model grid, hourly up to 54h, every 3 hrs afterwards; grib format
- ❑ graphics based on Magics → ALARO intranet web site
- ❑ specialized forecasts for different customers

ALARO-ROMANIA



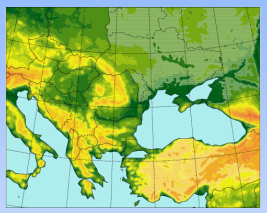
Δx=6.5km 240 x 240, 49 levels
Δt=240 s; hydrostatic
4 runs/day 00, 06,12,18
LBC ARPEGE 3 hrs frequency

ALARO-Bucharest



Δx=2 km 120 x 120 , 49 levels
Δt=45 s ; non-hydrostatic
LBC from ALARO-Romania (1h)
Input for Chemistry and
Transport models

ALARO-SELAM



Δx=11.5km 240 x 192
Δt=450
2 runs/day 00,12
LBC 6 hours frequency
Input for Marine applications

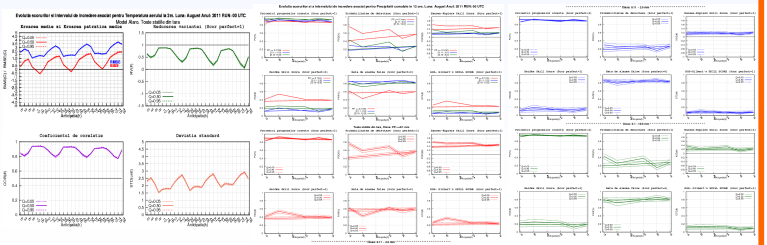
ALARO – Bucharest

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

➢ **Same platform as for ALARO Romania**
➢ **Same model characteristics like ALARO Romania**
but non-hydrostatic version, Δt=45s
➢ **domain covering Bucharest area**
➢ 1 run / day 00 ⇒ 24 h forecast range
➢ boundary conditions from ALARO-Romania (1 h coupling frequency)

ALADIN - mainly as a back-up solution
- frozen version (cy28t3)
- domain: covering Romania and surroundings, 144 x 144 points (Lambert Projection – quadratic grid), · Δ x=10 km, 41 vertical levels

Verification of ALARO – DMO (O. Diaconu)



Temperature at 2 m (left) and precipitation cumulated in 12 hours for different classes (middle and right)

RESEARCH & DEVELOPMENT

- mainly within ALADIN and RC-LACE projects –

➢ prognostic convection validation

➢ EPS: the validation of forecast performances of the ensemble systems involved in B08RDP project (Beijing 2008 Olympics Research and Development Project) developed under WMO/WWRP : NCEP, CAMS, NMC, JMA, MSC and ZAMG (ALADIN-LAEF)

➢ data assimilation: 3DVAR, only the conventional data (SYNOP, TEMP, AMDAR) and first steps in using local data (SYNOP)

B. COSMO&HRM-RO applications

R. DUMITRACHE, C. BARBU, M.BOGDAN, B.MACO, A.IRIZA

COSMO-RO – integration characteristics

COSMO-Ro7

- ➢ Δx= 7km ; 40 levels; Δt=72s
- ➢ IC & LBC: GME 00, every 3h
- ➢ Data Assimilation: Synop data
- ➢ Forecast range: 78h
- ➢ Operational suite for 2 runs/day (00, 12)

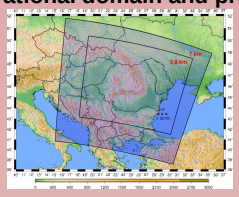
COSMO-Ro2

- ➢ Δx= 2.8km ; 50 levels; Δt=25s
- ➢ IC & LBC: COSMO-Ro7, every hour
- ➢ Data Assimilation: not available (yet)
- ➢ Forecast range: 30h
- ➢ Operational suite for 1 run/day (00 UTC)

Physical parameterizations:

- Clouds and precipitation
  - Grid-scale: 2-ice category scheme, prognostic
  - Convection scheme: Tiedtke
  - Grid-scale and convective clouds, total cloud cover
- Radiation
- Turbulent fluxes
- Soil processes

Operational domain and products



- ➢ T_{2m}; V_{10m}; MSLP
- ➢ total, convective, grid scale precipitation
- ➢ geopotential 850, 700, 500 hPa
- ➢ cloudiness
- ➢ meteograms
- ➢ SkewT diagrams

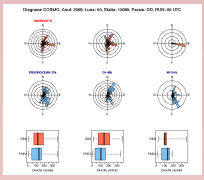
Research – development activities

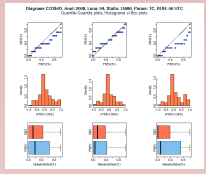
- Testing different convection schemes, soil humidity initial conditions , microphysical parameterizations and numerical schemes for COSMO-RO at 7 & 2.8 km resolution
- Operational evaluation of COSMO-RO using the "VERSUS" verification package

Developments in the frame of COSMO consortium

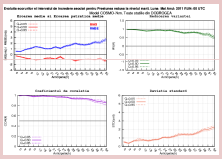
- Participation on the priority project **"Km-Scale Ensemble-Based Data Assimilation"**
- Participation on priority projects ***"VERSUS 2"***
- Participation on priority projects SPRT ***"Support Activities"***

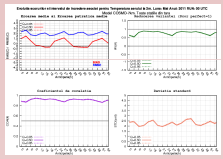
COSMO-RO7
VERIFICATION RESULTS (O. Diaconu)

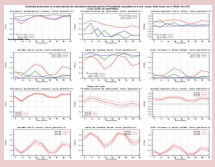


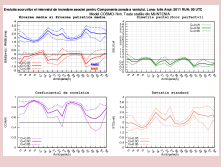


a) Monthly descriptive diagrams for some Romanian cities









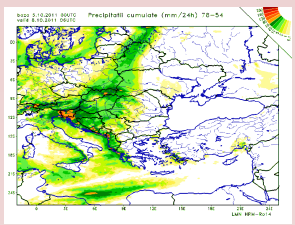
b) Monthly skill scores for some specific regions, for the entire country and for all mountain stations

Future Local developments

- Evaluation of the COSMO model using ECMWF data as initial and boundary condition
- Improvement of the data visualization
- Data assimilation for radar data.

HRM-RO

- Full operational implementation
- Initial and boundary conditions from GME-DWD
- Rotated geographical grid 0.125°, 40 vertical level s
- 78 hours forecast range, one run/day



HRM operational domain:
24h cumulated precipitation forecast