

# **ALADIN** activities in Romania

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## ALADIN

## **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

- $\blacktriangleright$  frozen version (cy28t3) mainly as a back-up solution
- physical parameterizations : quite simple in respect to the last developments
- $\succ$  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

## **ALARO**

#### **Operational suite – <u>important changes</u> <u>since last year</u>**

- platform IBM BLADE Linux cluster
- change of the model version: ALADIN (still "alive"- backup)  $\Rightarrow$  ALARO
- change of the computing platform

ALARO model: cy35t1

#### 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

**LBC** from ARPEGE



 $\succ$  the precipitation pattern - quite well simulated by ECMWF/EPS and ECMWF/EPS clustering averages - slight improvement for south-eastern Romania after clustering

> Last 24 h cumulated precipitation: 23.06.2010, 06 UTC 10 representative members from ECMWF/EPS clustering, base : 19.06.2010



- □ 49 vertical levels

#### Post-processing and visualization

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







 $\Delta x = 6.5 \text{ km } 240 \times 240, 49 \text{ levels}$  $\Delta t=240$  s; hydrostatic 4 runs/day 00, 06,12,18 LBC 3 hrs frequency

 $\Delta x=2 \text{ km } 120 \text{ x } 120$ , 49 levels ∆x=11.5km 240 x 192  $\Delta t$ =45 s ; non-hydrostatic ∆t=450 s LBC from ALARO-Romania (1h) 2 runs/day 00,12 Input for Chemistry and Transport models 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

The precipitation amount is underestimated for both cases ;

the 10 representative members obtained by clustering method: - only some of them show a good precipitation pattern: 9, 13, 29, 41 (00 UTC) - members 13, 44, 29 give a signal in the north of Romania, where the amount of precipitation reached up to 105 mm.

#### Precipitation verification for ALARO forecast (22 – 23 June 2010)

**MET (Model Evaluation Tool)** http://www.dtcenter.org/verification/ -highly configurable tool -for precipitation **MODE**: Method for Object-Based Diagnostic Evaluation (Davies et al. 2009, Weather and Forecasting, 24, 1252-1267)



- Same platform as for ALARO Romania
- Same model characteristics like ALARO Romania but non-hydrostatic version,  $\Delta t$ =45s
- domain covering Bucharest area
- 120 x 120 points (Lambert Projection linear grid)  $\Delta x = 2$  km
- 49 vertical levels
- $\blacktriangleright$  1 run / day 00  $\Rightarrow$  24 h forecast range
- $\blacktriangleright$  boundary conditions from ALARO-Romania (1 h coupling frequency)
- Statistical adaptation (MOS still based on ALADIN)
- Local verification : unified procedure for all models (daily, monthly, annual) statistical scores

#### **RESEARCH & DEVELOPMENT**

- mainly within ALADIN/RC-LACE projects -

 $\blacktriangleright$  prognostic convection validation

- short range EPS (LAE.F, local multi model EPS)
- $\blacktriangleright$  data assimilation: first steps in using 3DVAR





	Forecast O		Obser	vation		Forecast	Observation	
Model:	ALARO	D			Mask M/G/P:	on/off/off	on/off/off	
Field:	APCP		APCP_24		Raw Thresh:	>=0.20	>=0.20	
Level:	SFC	SFC			Conv Radius:	1 gs	1 gs	
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Initial: 20100621			20100623		Area Thresh:	>=0 gs	>=0 gs	
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					Simple/M/U:	1/1/0	16/2/14	
Centroid/Boundary:		2.0	0	4.00	Area:	1477 gs	924 gs	
Convex Hull/Angle:		0.0	0	1.00	Area M/U:	1477/0	61/863	
Area/Intersection Area:		1.0	0	2.00	Cluster:	1	1	
Complexity/Intensity:		0.0	0	0.00	MMI:	0.8724	0.0000	
Total Interest Thresh:		0.70			MMI (F+O):	0.0000		

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	Centroid/Boundary: Convex Hull/Angle: Area/Intersection Area: Complexity/Intensity: Total Interest Thresh:		2.00	4.00	Area:	208 gs	269 gs	10	4	
			0.00 1.00		Area M/U:	112/96	158/111	10	-	
			1.00	2.00	Cluster:	4	4	1	5	
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			0.70		MMI (F+O):	0.6870	0	4	1	
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Cluster Object Information



Object identification for ALARO: 24h Precipitation for different convolution thresholds and radius



0.6313

ΝA