

1. Summary of main activity

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During the last annual working period few changes were registered on ALADIN/Portugal operational system although it was necessary to take in to account ARPEGE (Météo-France) coupling dissemination changes – new computer platform and new ARPEGE resolution. A full upgrade of the actual Portuguese NWP operational system is being planned and should take place in 2008. This will be done in two steps, but totally will accommodate the following changes: a new computer platform, scripts under SMS/Xcdp, a new cycle version, new physics, new geographical domains and resolutions, new coupling frequency and increase of vertical levels. Present and former studies results will be incorporated in such major changes. Moreover, evolution has taken place on the NWP verification procedures in order to have a daily methodology to check the temporal consistency of the model performance. Wind dynamical adaptation is now operational as a result the development of a meteorological tool for wind power supply management. Progress on the local NWP database – TIDB2 - has also taken place and historical runs since 2006 are now accessible through it. Cooperation with Portuguese Universities have been a concern.

2. Workstation version of ALADIN/Portugal

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2.1 History of the Main Events

Since 24 of April 2000, IM runs a Limited Area Model (LAM) in operational mode. This NWP model is a local installation of the ALADIN model, hereafter called ALADIN/Portugal model.

The following operational changes took place:

- Apr 2000 → cycle AL09
- Jun 2000 → cycle AL11T2 (CYCORA included)
- Jul 2001 → cycle AL12_bf02 (CYCORA_bis included)
- Apr 2002 → change of the time step (540s to 600s)
- Nov 2002 → dissemination of coupling fields to support ocean modelling
- June 2006 → cycle AL28T3 (new geographical area and climatologies)
- June 2007 → wind dynamical adaptation for 3 geographical domains

Pre-operational:

- CANARI surface analysis fields

2.2 Foreseen activities

- Upgrade the local operational system: new computer platform (IBM HPC 10xp575: 16 power 5+, 1.9 GHz, 32 Gb RAM), geographical area increase, resolution increase; coupling frequency and the number of levels increase
- SMS implementation
- Operational implementation of CANARI as surface objective analysis tool for forecasting purposes
- Testing integrations over the Portuguese islands of Azores and Madeira

2.3 Operational version

The operational environment and main characteristics of ALADIN/Portugal are:

Computer characteristics

DEC Alpha servers cluster: 4/275, 128Mb each, 36 Gb of mirrored disk space
True 64 UNIX
Native F90 and 77 Compilers and native C Compiler

Model characteristics

Spectral hydrostatic model
Hybrid vertical co-ordinates
DF initialisation
Semi-Implicit Semi-Lagrangian two-time-level advection scheme
ISBA surface parameterisation scheme
Initial and lateral boundary conditions from the latest ARPEGE forecast
6 hour coupling frequency from ARPEGE
New integration domain (AL28-12,7km)

Integration domain:

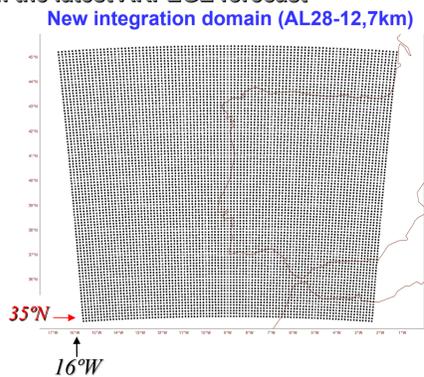
- Size: 108x108 points
- Number of vertical levels: 31
- Horizontal resolution: 12,7 km
- Time step: 600 s
- Integration frequency: twice a day
- Forecast range: 48 hours
- Output frequency: 1 hour

Available configurations

001, e927

Graphical software

The METVIEW/MAGICS graphical software (ECMWF) is used both in UNIX and Linux operating systems. Besides, a user-friendly visualisation tool for PC's was designed to display up to a maximum of three overlapped meteorological fields coming from the last two operational runs of the model.



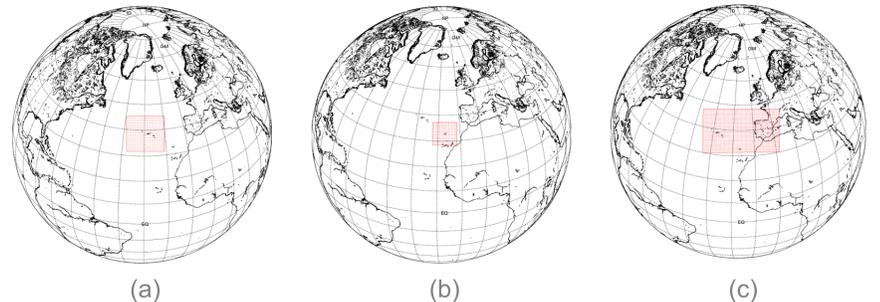
3. New geographical domains

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A new computer platform suitable for operational activities composed of a 10 nodes IBM p575 system with 16 CPU's each, 32Gb memory each, 2Tb of total disk space, is now available under AIX operational system. A DELL cluster with 10 duo quadri-core Intel XEON 2,66GH CPU's, 4x2Gb memory each and 8 Tb total disk space each, is being used as front-end machine for jobs submission under SMS/Xcdp, NWP archive (under TIDB2), products dissemination and visualization tools platform, in a recursive way (twin machines with the same function), under the PaiPix/IM live Linux distribution.



Taking full advantage of these capacities, new geographical domains for future models integration are being tested, not only to cover the territory of Portugal Continental, but also the Portuguese Islands. In particular, case-studies will allow to achieve to some "optimised" geographical configuration.



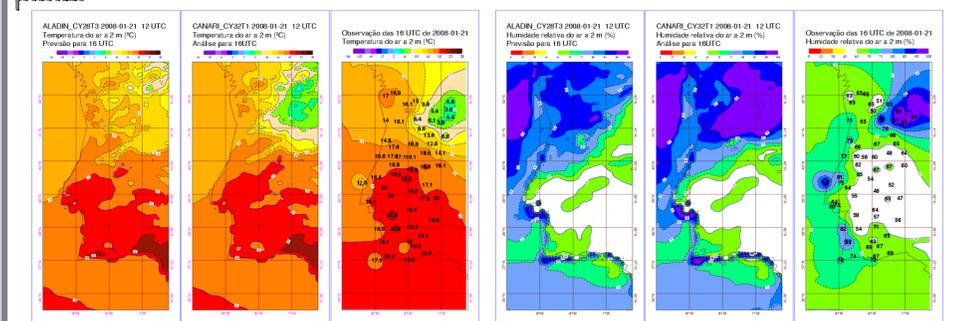
Legend – possible geographical domains for ALADIN/ALARO integration over the Portuguese territory, Continent and Islands: (a) Azores; (b) Madeira; (c) Large Portuguese territory

4. Other activities

4.1 CANARI

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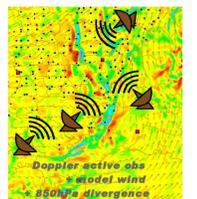
CANARI, the ALADIN tools for objective analysis by Optimal Interpolation method, has been implemented in pre-operational mode. Hourly analyses are performed from 03 to 12 UTC and from 15 to 24 UTC, for the time being just for forecasting purposes. Examples are shown for 2 metres temperature and relative humidity. The pressure at mean sea level will be also available near forecasting.



4.2 2nd AROME training course

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From the 4th to the 7th of March 2008, the 2nd AROME training course was held at IM headquarters in Lisbon as a joint organization of the Portuguese meteorological service and Météo-France.



This training course tried to be a natural answer to the Portuguese Universities interest on setting up some collaboration with the ALADIN community in particular on the development of the new models generation.

Lectures on theoretical aspects on Méso-NH physics, AROME settings, NH dynamics in "A-models", radar data assimilation, RUC in AROME, DDH, SURFEX and on how to run AROME in the real-time weather forecast and research modes were balanced with practices where 1D and 3D exercises were performed remotely using ECMWF computer resources.

See presentation "Debriefing of Lisbon AROME training course".