

Operational and other ALADIN activities in Meteorological and Hydrological Service of Croatia

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1. Summary

There are two operational suites currently running on the two SGIs in Croatian Met. Service. The old one “mrcina” 54 hour forecast is kept for backup and few external users that are reluctant to move to the new one. Since 1st December 2005 only one “big” main domain HR88 is used with 8 km resolution in horizontal and 37 levels in the vertical. The new SGI “viking” (Figure 1) is used for operational 72 hour forecast since the first half of May 2006, it has been upgraded from 16 to 24 processors during the first half of September 2006. The backup for the transfer of the LBC files is RMDCN from eagate.

2. Operational suite

2.1 Status

ALADIN is operationally run twice a day, for 00 and 12 UTC. Coupling files are retrieved from ARPEGE (Meteo-France global model) via Internet and RMDCN through eagate. Model resolution is 8 km for Croatian and 2 km for the high-resolution dynamical adaptation domains. The execution of the suite is controlled by the OpenPBS (Portable Batch System) as the queuing system on the old SGI and PBSPro on the new SGI.

Initialisation of ALADIN on Croatian domain is provided by Digital Filter Initialisation (DFI). Coupling frequency and frequency of output files is 3 hours. The forecast range on the old SGI is 54 and 72 hours on the new one. The operational version of Aladin on the old SGI is AL28T3 including some additional modifications linked with SLHD and physics parametrizations. On the new SGI AL29T2mxl is used.

Visualisations of numerous meteorological fields are done on LINUX PCs. Comparison of forecasts with data measured on SYNOP and automatic stations is done hourly for the last 5 runs giving an EPS-like picture through 5 days (Figure 2). The products are available on the Intranet & Internet. Internet address with some of the ALADIN products, like total precipitation and 10 m wind: http://prognoza.hr/aladin_prognoza_e.html.

The operational suite on the old SGI will be stopped as soon as all the users switch to the new one.

2.2 The new computer



Figure 1. SGI Altix LSB-3700 BX2 Server with 24 Intel Itanium2 1.6GHz/6MB,

48 GB standard system memory, 2x146 GB/10Krpm SCSI disk drive,

OS SUSE Linux Enterprise Server 9 for IPF with SGI Package,

Intel Fortran & C++ compilers, PBS Pro for LINUX,

Aladin code (including a version of Alaro) is ported. Better optimisation of code is still missing. Some problems were solved during compilations as accvimp and accvimpd should not be optimized with Intel compiler version 9.0. PALADIN, emoslib, gribeuse are installed too. Thanks a lot to Jure Jerman for help. gmckpack is installed, thanks a lot to Ryad El Khatib.

2.3 Operational model version

The operational version of Aladin is AL29T1 including the “mxl” modifications introduced in Prague. The semi-Lagrangian horizontal diffusion is on.

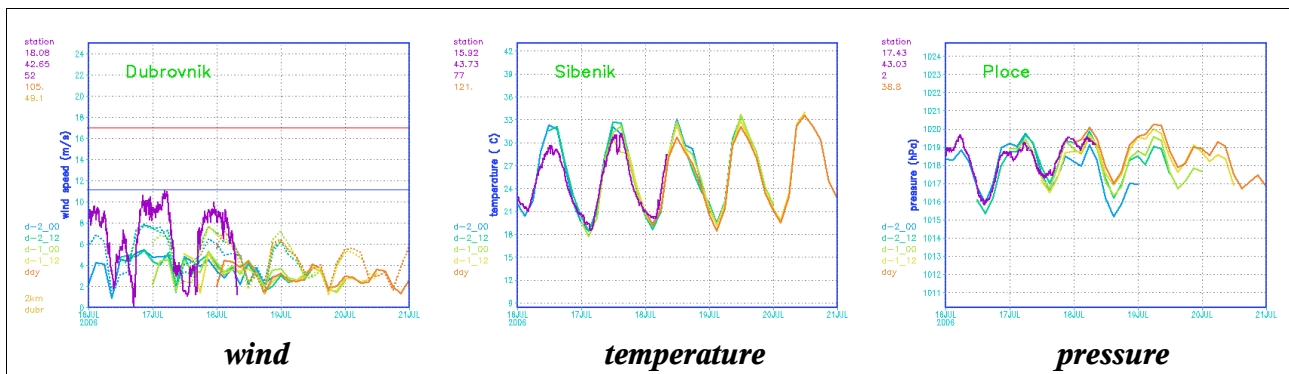


Figure 2. Comparison of forecasts with to the measurements from automatic stations for 10m wind in Dubrovnik (left), temperature in Šibenik (center) and pressure in Ploče (right), 8-km resolution forecasts are in full lines, 2-km resolution wind speed is dashed, measured 10-minute average is purple.

2.4 Problems

The RMDCN line from ECMWF to Croatian service is 64 kbps what is too slow to provide LBC files in a reasonable time. The transfer of files takes 5 hours. The gateway used for the unattended file transfer from *pluton.dhz.hr* often does not provide the required service – the gateway service or the computer is down.

During July and August, the internet connection was sometimes very slow, more often towards the end of August. Since the beginning of September, it was becoming unbearable. On 13th September internet was working with about 100 bits per second. RMDCN was also useless during the morning, so there was no operational forecast for 00 run. Gateway was fixed. The internet connection remained so slow until monday, 18th September. During that time it was not possible to log in to the service from the outside. All the PCs in the service, except the operational ones, were switched to a different internet connection that was working properly. The computer with gateway was switched off during the morning of 16th so there was no operational forecast for 00 run. All the other runs were severely late since we had to rely on the slow RMDCN line. The first explanation we got from the computer department was after the internet line got fixed and it was that there was something wrong with the radar.dhz.hr machine, that they replaced the hardware and internet has been working fine so far.

2.5 Plans

The old set of operations should be switched off as soon as possible. RMDCN line should become much wider to provide more useful backup to the internet.

ALAR00 should be run at least on a daily basis. The size of domain and forecast range will be set depending on the cost of it.

A possibility to use smaller number of larger high resolution dynamical adaptation domains is considered. Also, usage of SLHD and NH dynamics in this part of operational suite would be beneficial.

2.6 Domains

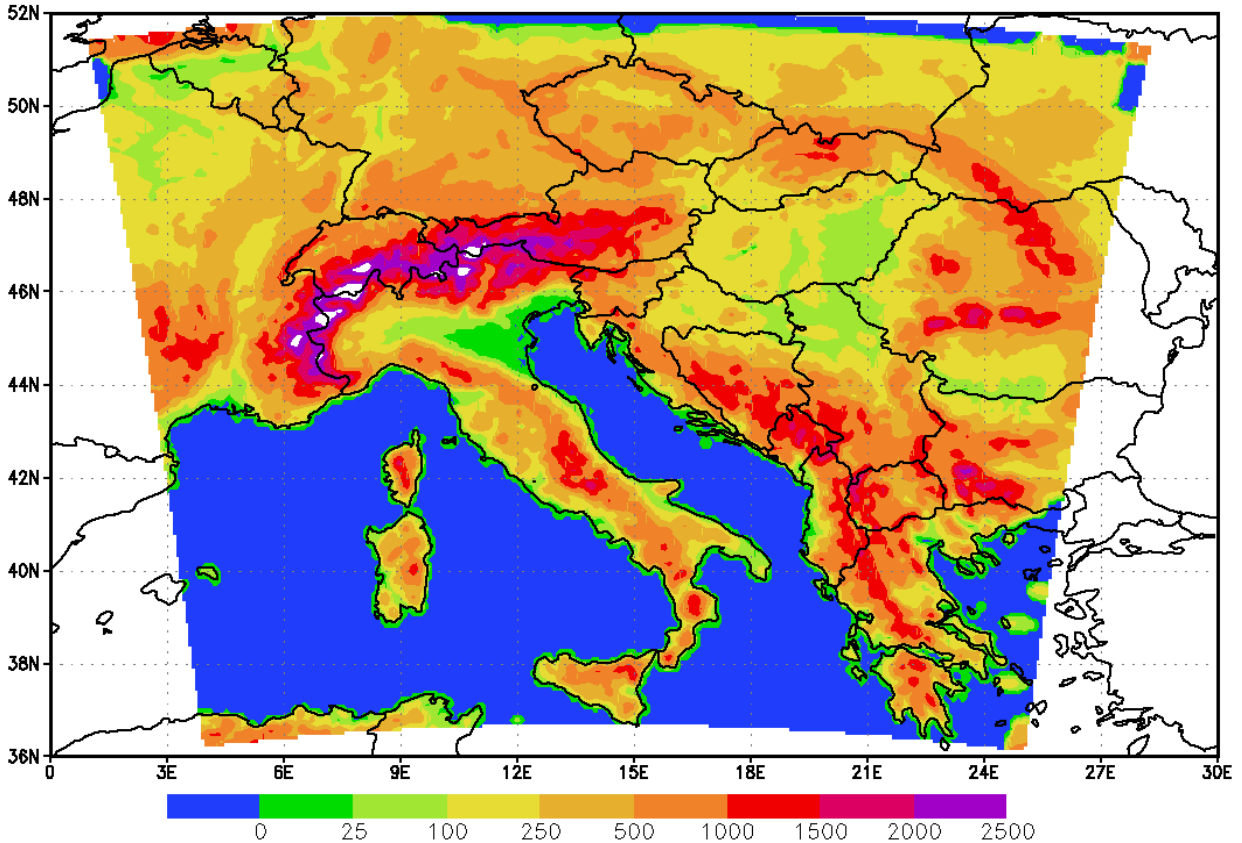


Figure 3. The operational 8-km Croatian domain.

Horizontal resolution of the Croatian domain is 8 km, 37 levels in the vertical, time-step 327 sec, 229x205 grid points (240x216 with extension zone). Corners: SW (36.18,3.90), NE (50.68,26.90).

The only change related to the 6 domains for the dynamical adaptation of the wind field in the lower troposphere to 2-km resolution orography for mountainous parts of Croatia is the removal of envelope. Dynamical adaptation is run sequentially for each output file, with 3 hour interval. In the dynamical adaptation meteorological fields are first interpolated from input 8-km resolution to the dynamical adaptation 2-km resolution. The same file is used as a initial file and as a coupling file that contains boundary conditions for the model.

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