

Status report of the Czech Hydrometeorological Institute (CHMI)

(October 2004 - September 2005)

The key NWP application at CHMI is the ALADIN/CE model run on NEC SX6/4B-32 machine. It can be characterized by following:

- LACE domain (309x277 grid points, linear truncation E159x143, $\Delta x=9\text{km}$)
- 43 vertical levels, mean orography
- time step 360 s
- digital filter spectral blending long cut-off cycle (6h cycle, filtering at truncation E47x42, no DFI in the next +6h guess integration)
- digital filter blending + incremental DFI initialization of short cut-off production analysis
- 3h coupling interval
- based on ARPEGE/ALADIN cycle CY28T3 with the so-called Prague physical package and the SLHD
- 00 and 12 UTC forecast to +54h
- 06 and 18 UTC forecast to +24h
- hourly on-line fullpos

Besides the ALADIN/CE application the other ALADIN configurations are operationally used at CHMI:

- hourly DIAGPACK analysis of T2m, RH2m, v10m, KO-index, CAPE, MOCON (SYNOP observations)
- verification package based on cycle CY22T1/AL12 (CY28 in validation)
- monitoring of SYNOP and TEMP observation based on OI quality control
- post-processing of near-surface parameters into selected localities using obs-operators of OI

The special ALADIN/MFSTEP application (6 hours blending assimilation cycle and once per week 120 hours forecast) is computed for the purpose of the Mediterranean Forecasting System Toward Environmental Predictions EU grant. The special period for this grant has finished (in February 2005) but an interest of several scientific communities to still use such products was identified. CHMI accordingly continues with running this application. However the computational area was dramatically reduced (June 2005) to sub-area of the original domain covering mainly western part of the Mediterranean sea. In numbers this change means that original area of 589x309 grid points has been reduced to 256x200 grid points

with consequent change of the linear truncation from 299x159 to 127x99 waves. The 9.5 km horizontal resolution and 37 levels distribution has been preserved.

Plans for close future (already in parallel tests)

1. OI surface analysis based on SYNOP data replacing the surface blending:
The preliminary results are promising improving mainly 2m temperature and humidity. The switch is planned for winter 2005/2006 after experience from all seasons.
2. Replacement of the fixed mixing length profile by the interactive one based on PBL diagnostics after Ayotte and Tudor:
Satisfactory for all PBL except for the 2m temperature. Problem is probably linked to the other physical parameterizations and has to be further studied.