Italian Meteorological Service Status Report

Massimo Bonavita, Lucio Torrisi, Fabrizio Ciciulla and Antonio Vocino
CNMCA Pratica di Mare (ROMA)
bonavita@meteoam.it, torrisi@meteoam.it,
ciciulla@meteoam.it, vocino@meteoam.it

Regional Modelling and Data Assimilation

The regional model EURO_HRM, whose main features are summarised in table 1, is operationally run by the Italian Meteorological Service (IMS) over the domain shown in fig. 1. An intermittent 6-hour assimilation cycle is run to provide initial conditions for the model (Bonavita and Torrisi, 2005).

The main focus of activities over the past year has been the operational implementation of the direct assimilation of ATOVS AMSU-A radiances in the IMS objective analysis. This has been made possible by the near real-time availability of the NOAA-1X ATOVS observations through the Eumetsat EARS program and the use of the RTTOV7.1 fast radiative transfer model.

Channels 5 to 10 of the AMSU-A microwave sounder are currently used over the sea after a scan dependent biasa correction, rain contamination check and a 200 Km thinning. Impact studies have shown a moderately positive influence, more noticeable on the wind vector and MSLP fields (fig.2)

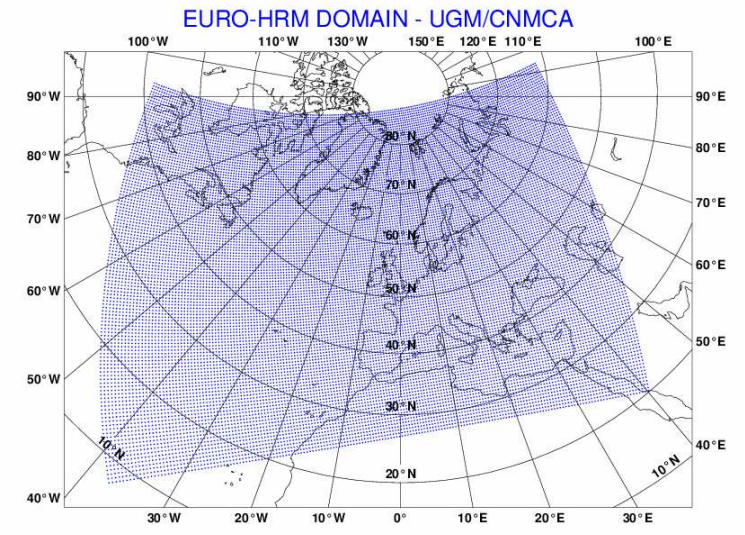

Fig. 1 Integration domain of EURO_HRM model

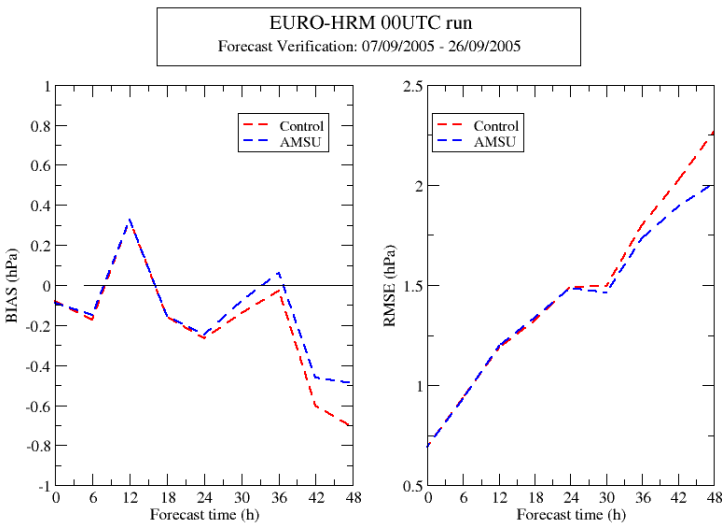

Fig. 2 Impact on MSLP forecast of AMSU-A obs.

Current development activities in the data assimilation sector involve:

1. the extension of AMSU-A usage over land and experimentation with AMSU-B radiances;
2. the experimental run of a 3-hourly data assimilation cycle in order to make use of the large amount of a-synoptic data which is currently discarded;
3. the experimental run of a parallel data assimilation cycle with an objective analysis based on a hybrid EnKF-3Dvar approach

4. horizontal resolution doubling (0.125 Deg., ~14 Km).

Table 1 Characteristics of EURO-HRM operational implementation

Domain size	385 x 257
Grid spacing	0.25 Deg (~28 km)
Number of layers	40
Time step and scheme	**150** sec, split semi-implicit
Forecast range	72 hrs
Initial time of model run	00/12 UTC
L.B.C.	IFS
L.B.C. update frequency	3 hrs
Initial state	CNMCA 3D-PSAS
Initialization	N.M.I.
External analysis	None
Status	Operational
Hardware	IBM P960
N° of processors used	14 (Model), 60 (Analysis)

Local Modelling

The main features of the operational implementation of the EURO_LM local Model over the Italian domain of integration (EURO_LM) are summarized in Table 2 and Fig. 2.

Table 2 Characteristics of EURO_LM operational implementation

Domain size	465 x 385
Grid spacing	0.0625 (7 km)
Number of layers	35
Time step and scheme	40 s,3 time-lev split-expl
Forecast range	60 hrs
Initial time of model run	00 UTC
Lateral bound. condit.	IFS
L.B.C. update frequency	3 hrs
Initial state	EURO-HRM 3D-PSAS
Initialization	Digital Filter
External analysis	T,u,v, PseudoRH, SP
Special features	Filtered topography
Status	Operational
Hardware	IBM P690 (ECMWF)
N° of processors	120

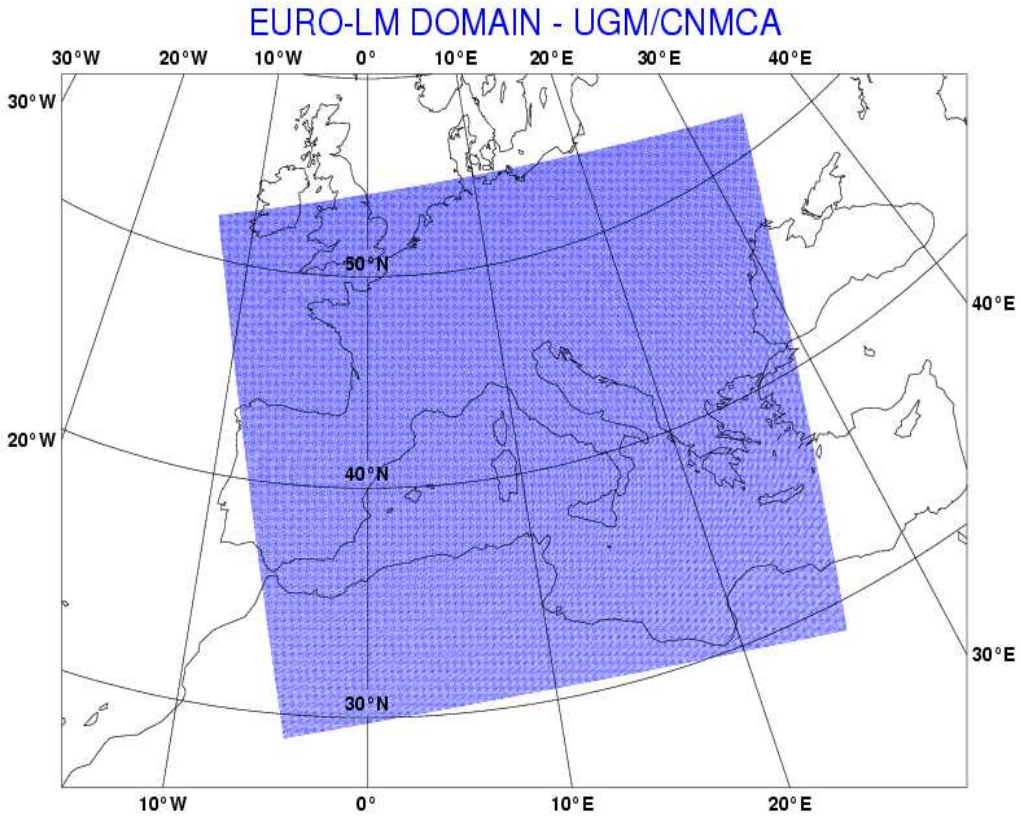

Fig.2 Integration domain for the EURO_LM local model.

Over the past year development for the EURO_LM local model has mainly followed developments and updates in the underlying Lokal Modell code base. This has meant the operational introduction of the new prognostic precipitation scheme and the 7-level soil model.
Current development activities are mainly concerned with the operational challenges of increasing the horizontal resolution to 2.5 – 3 Km.
It must also be stressed that both models (EURO_HRM and EURO_LM) and the underlying data assimilation cycle are in the process of becoming time critical applications at ECMWF, thus achieving an even higher level of operational availability and timeliness with respect to the already satisfactory standard.

References

Bonavita M., and L. Torrisi, 2005: Impact of a Variational Objective Analysis Scheme on a Regional Area Numerical Model: The Italian Air Force Weather Service Experience; Meteorology and Atmospheric Physics, Vol.88, No.1-2, pg. 38-52 (Springer).

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