



FIRST RUN OF AROME In MOROCCO

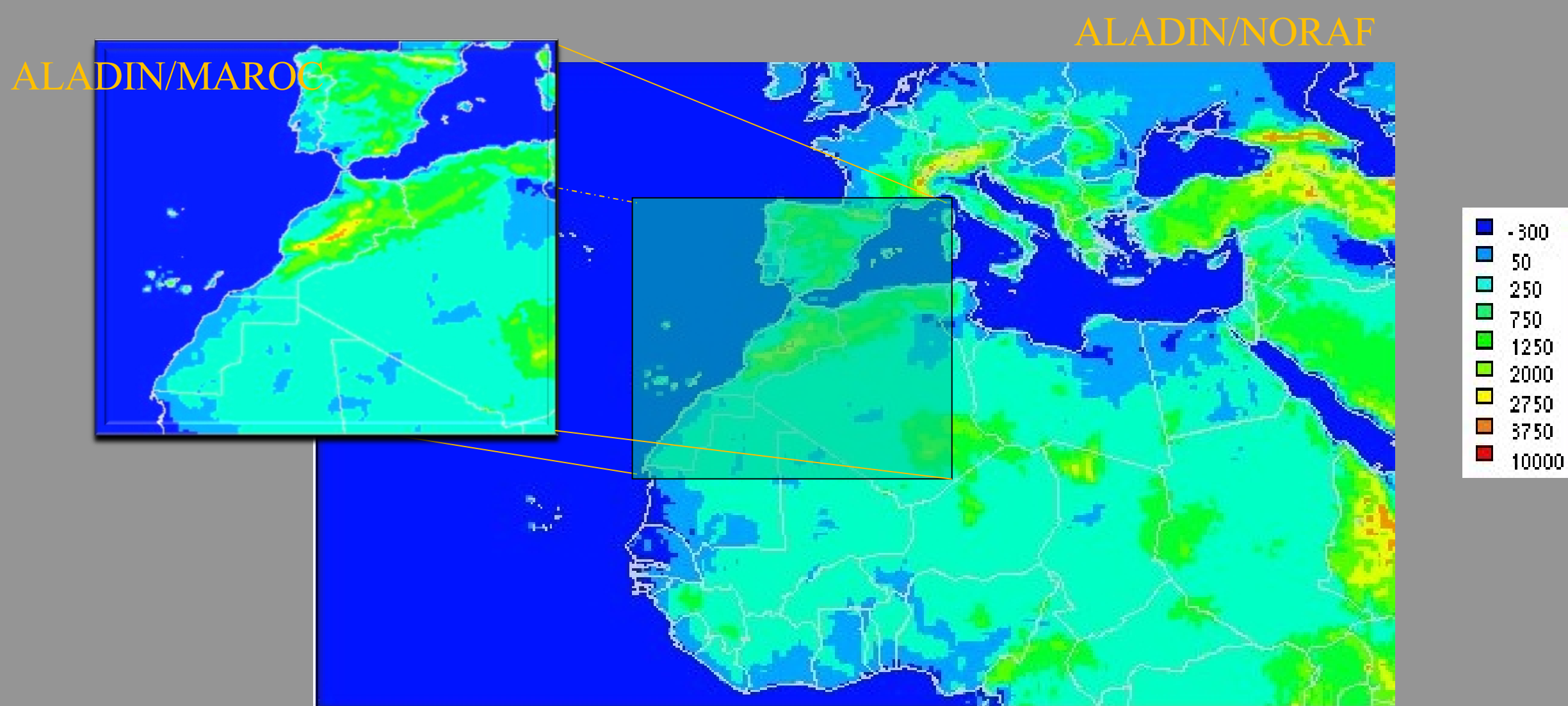
TADLA ZONE

K. ESSAOUINI & H. HADDOUCH

Centre National des Recherches Météorologiques, Maroc-Météo
essaouini@gmail.com
haddouchh@yahoo.com

1. Operational NWP Moroccan suites:

Two suites based on ALADIN are run twice a day: ALADIN/NORAF and ALADIN/MAROC. Their domains are respectively showed in figure1. They are run on an IBM parallel Machine, and used in operational way.



Technical characteristics:

	Horizontal Resolution	Vertical levels	Data assimilation	Range of forecast	Operation cycle	boundary conditions
ALADIN/NORAF	31km	37	Dynamical adaptation	72	CY29t2	ARPEGE Asynchronous
ALADIN/MAROC	16.7	37	Dynamical adaptation	72	CY29t2	NORAF Synchronous

2. The large scale coupling model characteristics

In order to make a primary AROME experiment in TADLA zone, we have prepared, in first stage, large scale coupling files. The characteristics of the coupling and AROME models are described below :

	Horizontal Resolution	Vertical levels	Data assimilation	Range of forecast	Operation cycle	boundary conditions
ALADIN/7km	7 km	41	Dynamical adaptation	48	CY32t3	ARPEGE
AROME/TADLA	2.5 Km	41	Dynamical adaptation	24	CY32t3	ALADIN 7 Km

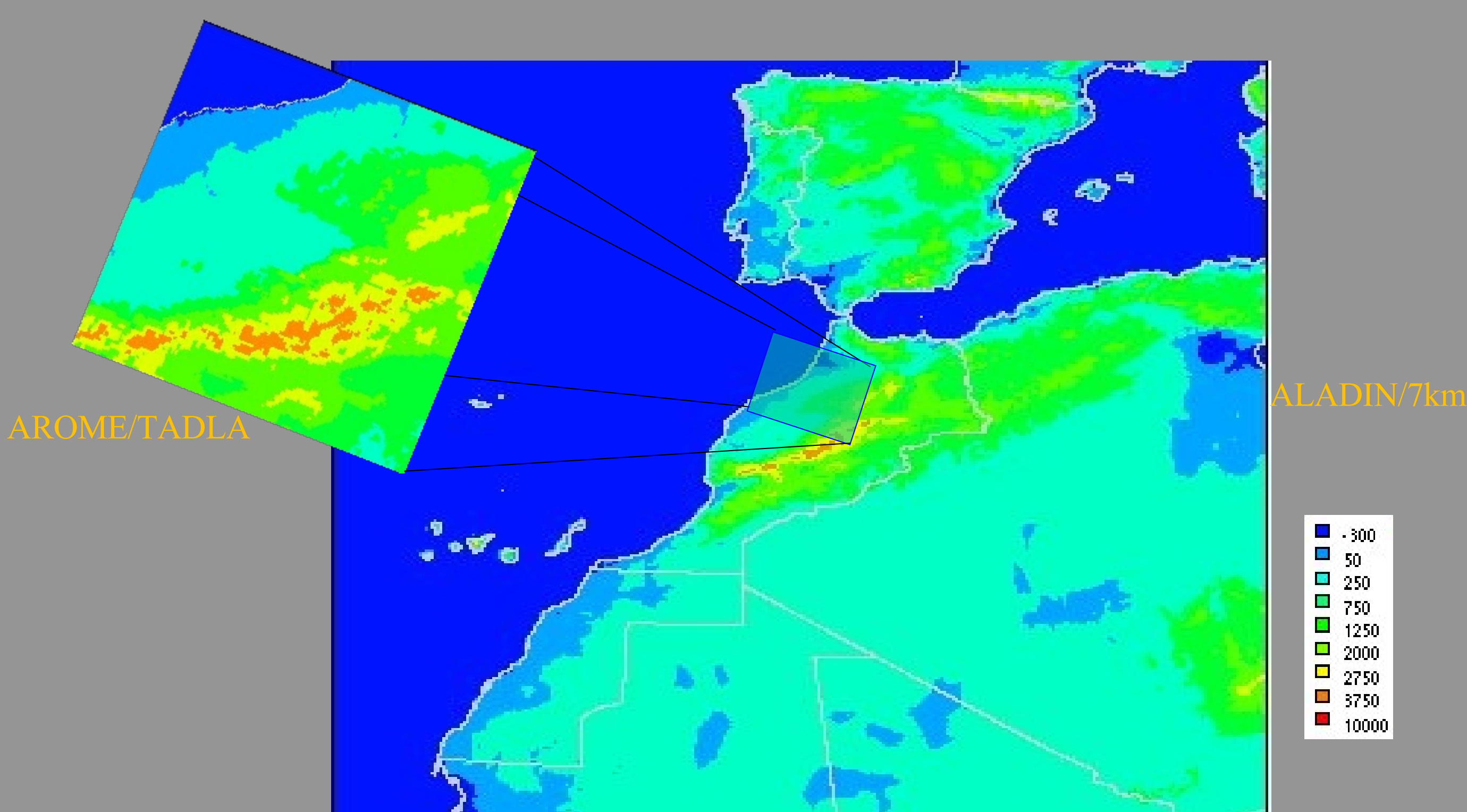


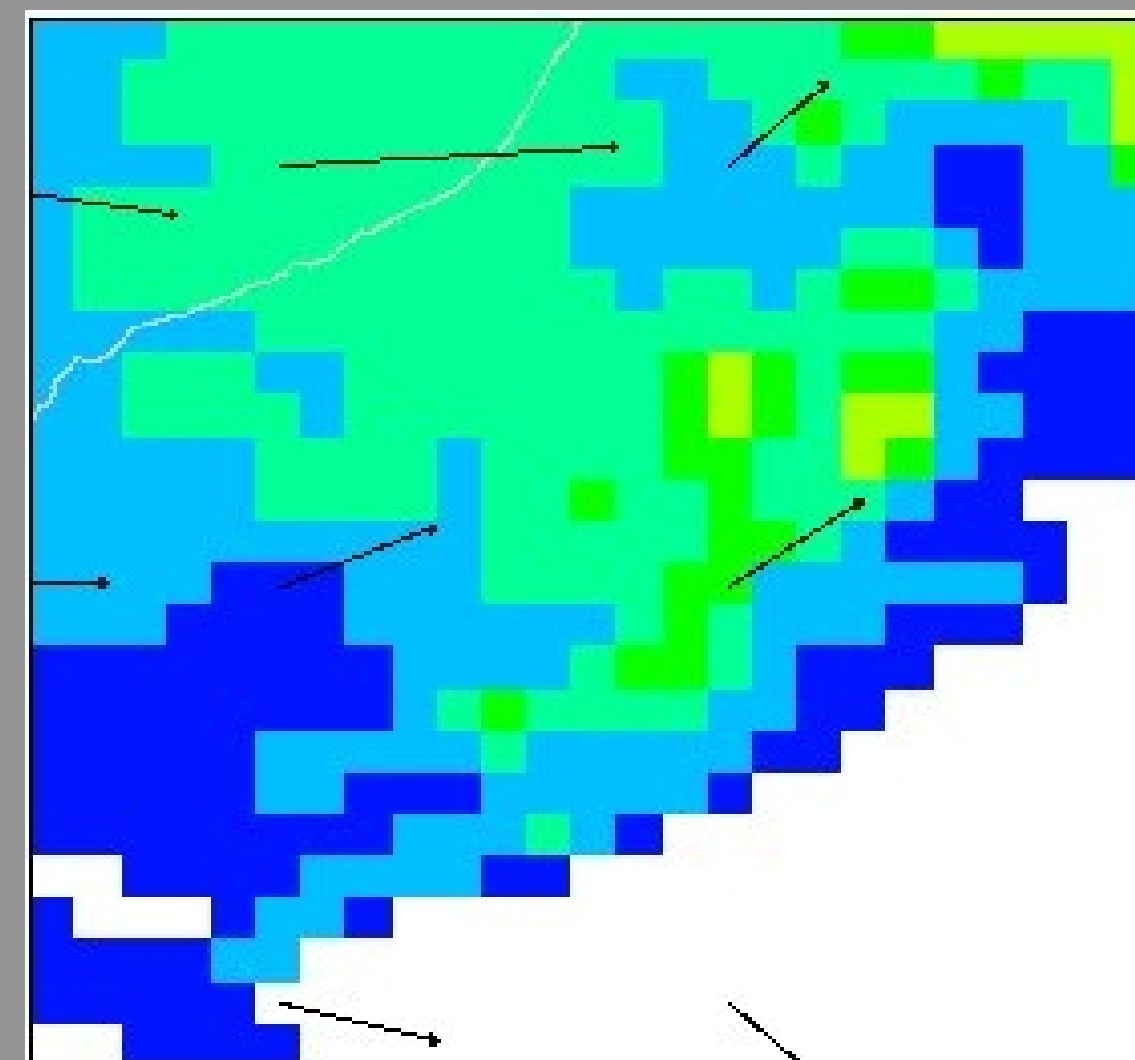
Fig 2 : Topography map with the ALADIN-MAROC 7 Km model domain. The AROME domain is also outlined, and mountain area is indicated.

This primary study aims at running an AROME experiment forecast in Morocco (Tadla domain). Initial conditions (dynamical adaptation and lateral boundaries) were provided by the ALADIN-MAROC 7 Km forecasts.

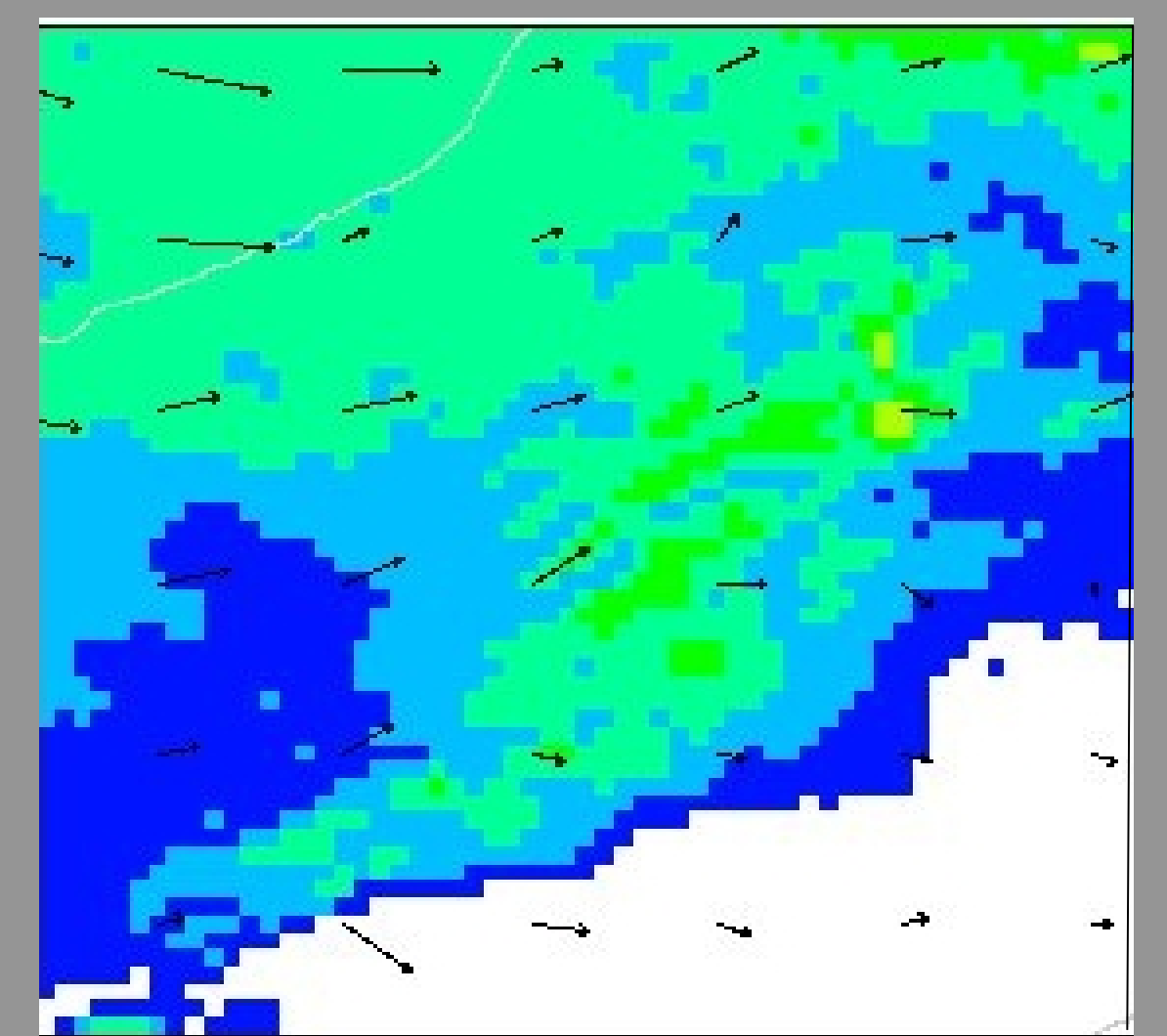
The AROME domain covers a small area [30.8°-34.1°N,8.7°-4.2°W] including Casa-Mohamed V airport, Binelouidane dam, casablanca urban area, Tadla agricultural region, High Atlas mountains over 3700m....

The run started at 00 UTC 03th Jan 2008 for 24 Hr range forecast.

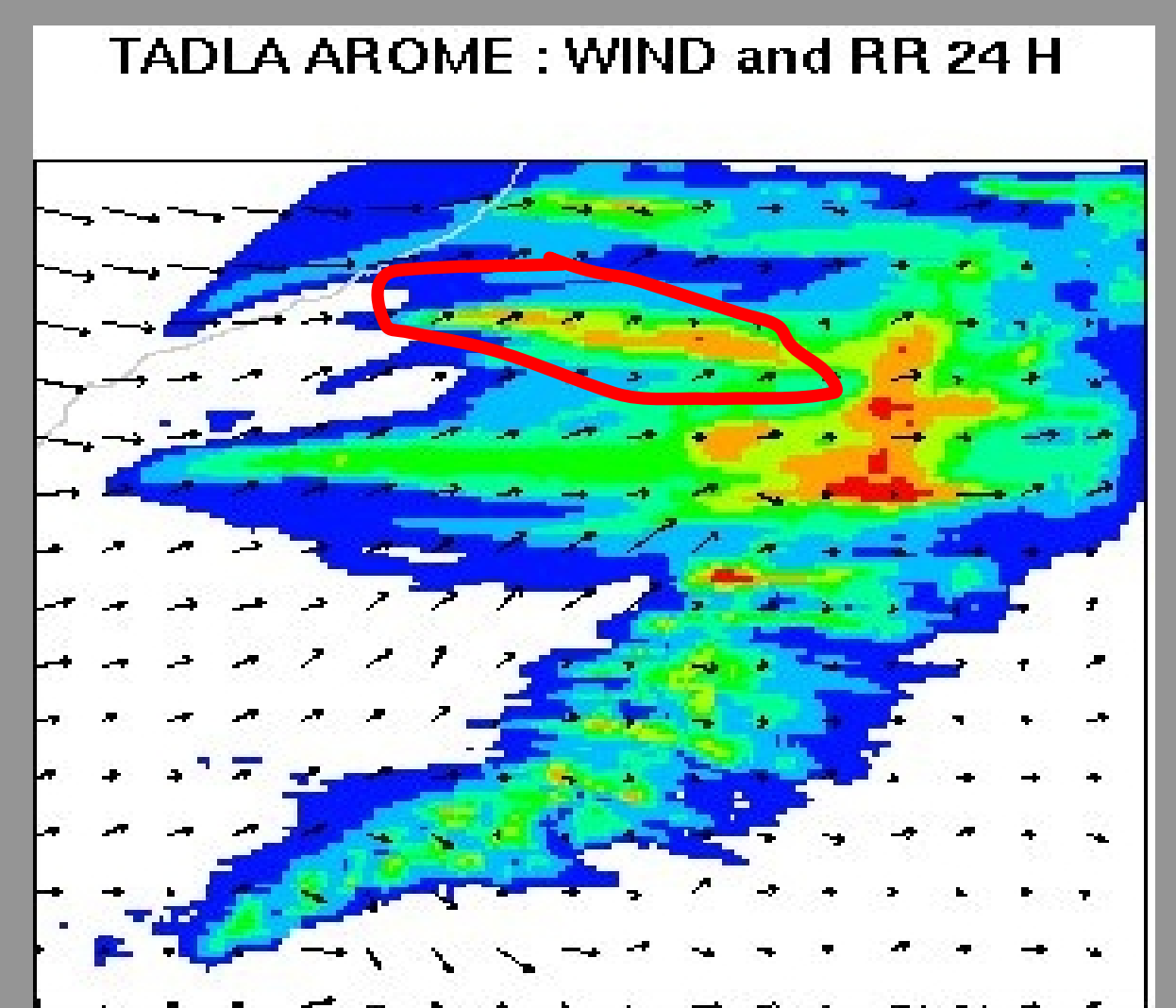
3. Forcasted precipitation over TADLA domain, 03 January 2008



3.a : wind and RR 24-H forecast with the operational cycle (16.7 km, 37 levels) max_RR=59.37 mm



3.b : wind and RR 24H forecast with cy325 (7-km,41 levels) max_RR=59.08 mm



3.c : AROME 24H forecast, max_RR=169.77 mm

The meteorological situation was characterised by a classical synoptic perturbation coming from the west. Precipitations have exceeded 100 mm in 24 hours.

To evaluate the Arome precipitation forecast over the TADLA zone, we have used estimated precipitation provided Fig.4 by the CPC.

the data concerns dally precipitation estimation (from 00H to 24H).

4. Subjective Evaluation regarding the CPC rain estimation

The 7 Km ALADIN model and also OPER ALADIN make it possible to localise precipitation cells (Fig 3.a, 3.b and Fig 4).

The AROME MODEL can predict heavy precipitations with a maximum of over 100 mm (Fig 3 C) at the north of TADLA zone. This is not the case with THE models ALADIN OPER and ALADIN 7Km (Fig 4)

However, the little precipitations coming from the west are best predicted by the ALADIN model (ALADIN OPER & ALADIN 7KM)

This is an overestimation of the rain on the High ATLAS mountains by AROME model (too much precipitation on the mountains)

Intense precipitations are frequent in AROME model.

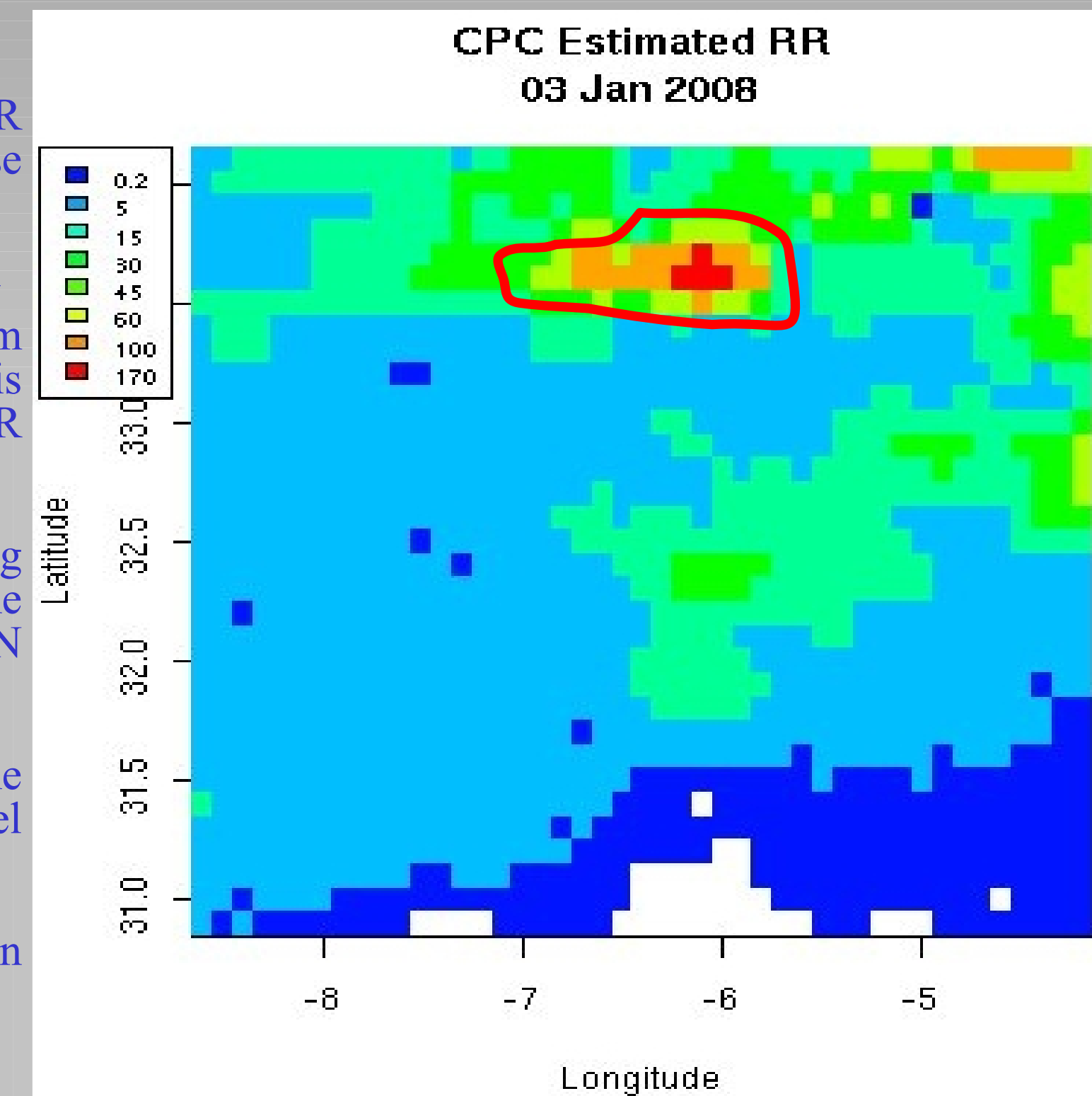


Fig 4 : CPC estimated rain, max_RR=125.87 mm

5. On going work

The first run of AROME model in Morocco for a 24 range forecast in a small domain over TADLA region have required about 10 hours in the IBM RS 6000 computing system installed in the meteorology service.

the DMN computing system change is programmed for the end of 2008, it will be possible to run more experiments to validate AROME precipitation forecast.

Surface conditions (climatological and PGD files) should be adapted to the high resolution over the concerned domain, taking into account ground texture, urban zones...

The AROME model allows explicit resolution of the deep convection. the target is to enhance thunderstorms prediction in the future over the TADLA region.

More Impact studies are needed to validate AROME model forecast in Morocco.