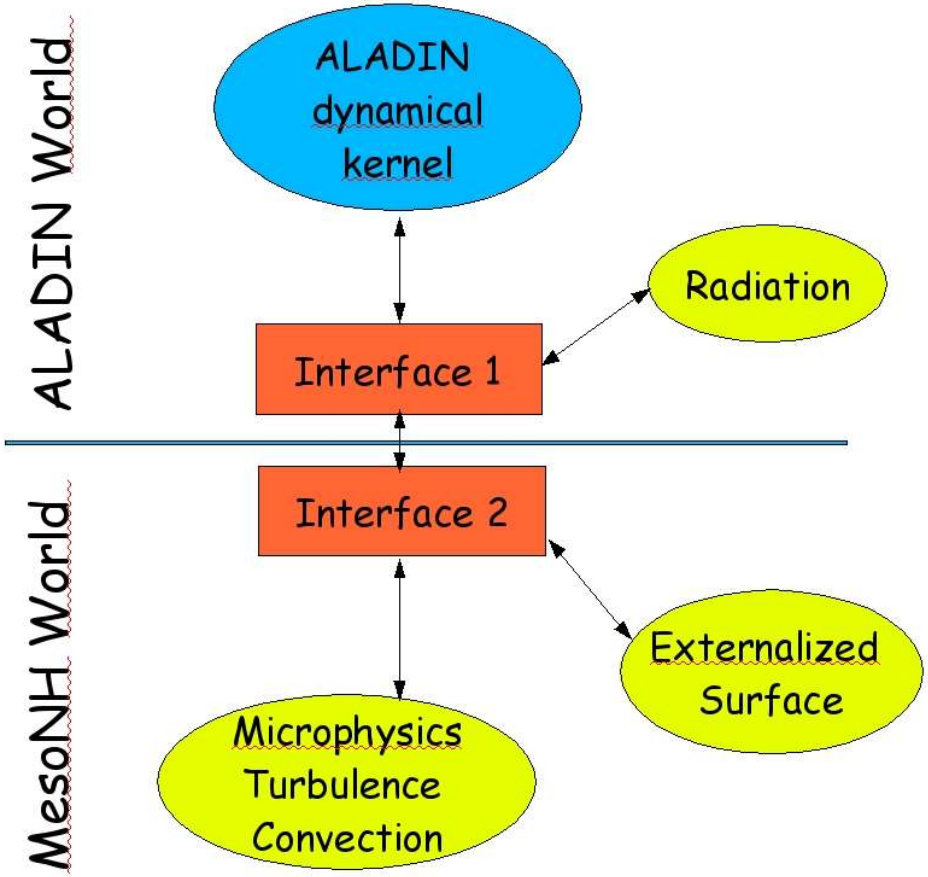
AROME~ALARO Last developments or What's new since Innsbrück ?

G. Hello, Y. Seity, S. Malardel, P. Bénard, R. Elkhatib, T. Kovacic, D. Banciu, L. Kullman, D. Raspaud, B. Catry, G. Casagrande, J. Cedelnik & many others sorry

AROME in common cycle (CY29T2)- export version since May 2005-



New ccase « vob »

Arp (new routines Interface1 + implications in existing routines)

mpa → conv, micro, turb

mse → Externalized surface to be used later on by others

AROME software

• param (conv, micro, turb)

Same structure as tal/tfl

- **Externals** (aro_*.mnh): written for Arome with mnh compilation rules
- **Interface** (aro_*.h) interface of the externals (that are seen in arp/ald)
- **Internals** (*.mnh): native mnh code
- **Module** (*.mnh): native mnh modules (modd and modi)

•**Gmkpack**: since 6.1 version option –p[arome] (Ryad Thursday morning)

AROME software

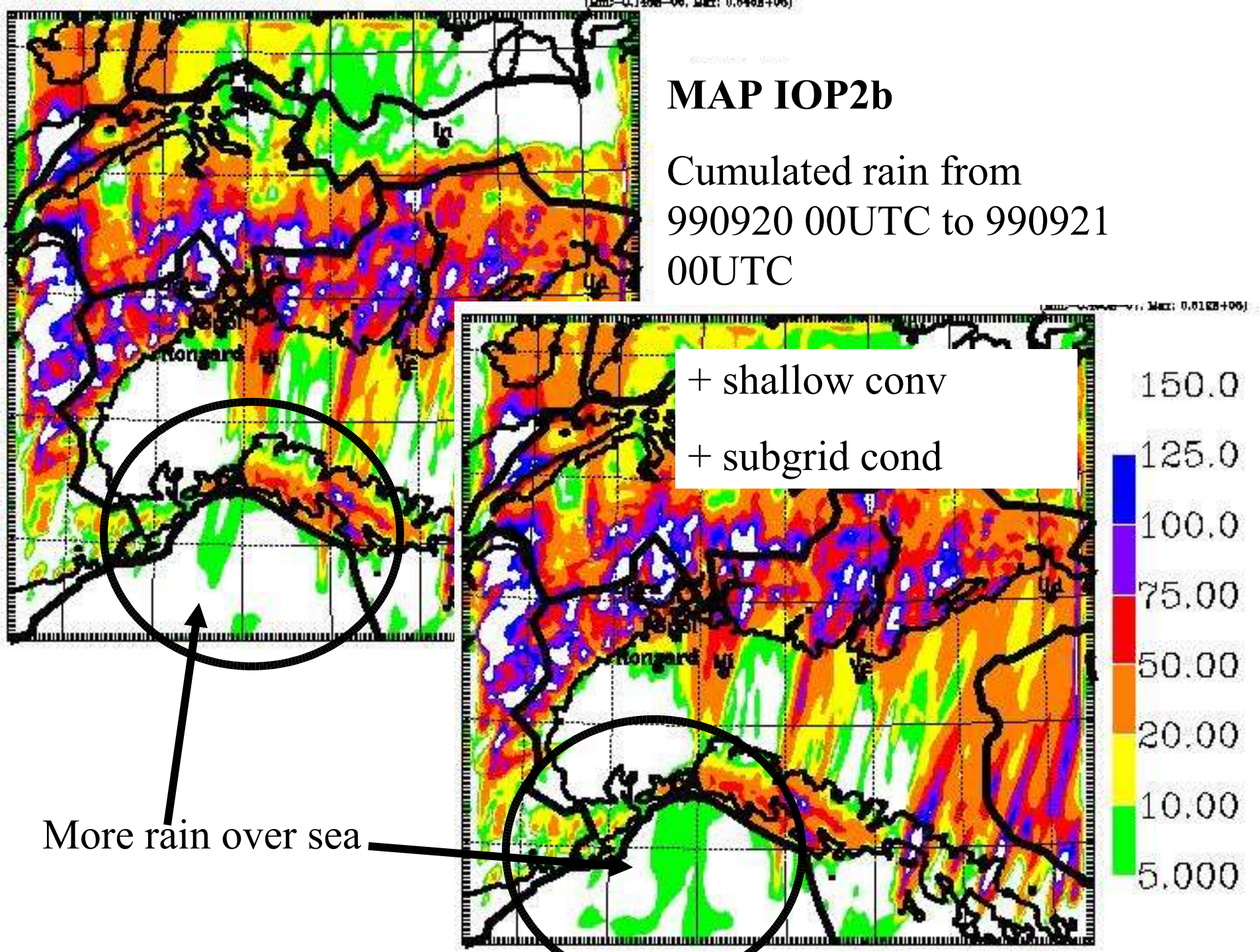
Dev already done since CY29T2

- **Possibility** to activate shallow convection alone (namelist option) ➔ in CY30

- **Possibility** to activate subgridscale condensation (2 options with TKE only or together with shallow convection)➔in CY30

MAP IOP2b

Cumulated rain from 990920 00UTC to 990921 00UTC



In progress developments

1. **Prep_surfex**
2. **Phys/dyn** interface in Alaro framework
3. **Chemistry** in Arome

« Aladin world »

(1) 923 I: o-géom, aladin database

O: climo.fa

(2) EE927 I: climi.fa, climo.fa, aladin.fa

O: caromeatm.fa

« Méso-NH world »

(1) Prep_PGD I: o-géom, mnh database

O: PGD.lfi

(2) extract_arpege I: aladin.fa

O: FPaladin.grib

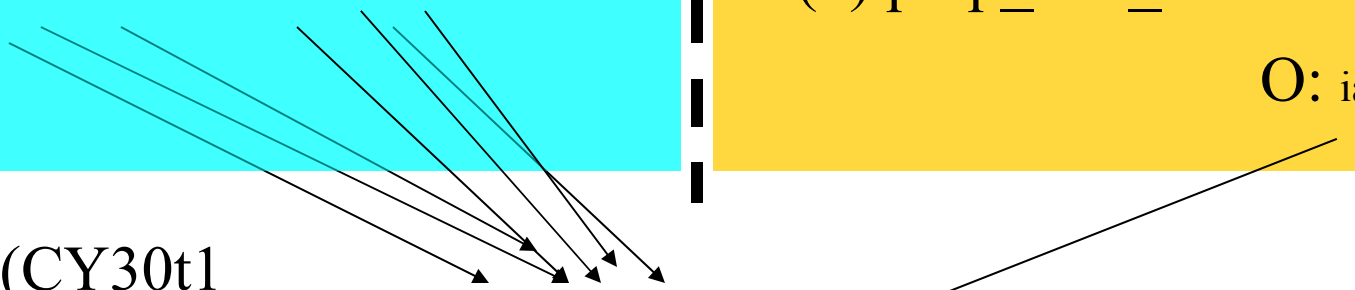
(3) prep_real_case I: FPaladin.grib, PGD.lfi

O: iaromesurf.lfi

(prep_surfex)

I: climi.fa, climo.fa, aladin.fa, PGD.lfi

O: caromeatm.fa, iarosurf.lfi



AROME.exe

Until now, 3 steps before running Arome !

Soon (CY30t1 hopefully), 5 steps before running Arome !

In progress developments

- **Phys/dyn interface**

Contexte: « Filières », Workstreams, Streams workplan on interfaces defined (Feb 2005) after the TCWGPDI Prague meeting, see also the Eqs & Interface session of this afternoon.

- Stream (D): Quasi-dynamical questions
  - Delta m option (first part), done in CY30 (dyn+ accvimp)
- Stream (B): Conversions tendencies-fluxes
- Stream (C): Diagnostis
  - (B) and (C) Evaluation & coding(partly) of a methodology to recover needed fluxes from méso-nh for the future common interface and also for the future diagnostics
  - (B) Definition of the extended flow scheme for the new CPTEND and agreement on a common nomenclature on the input fluxes for the computation of the tendencies

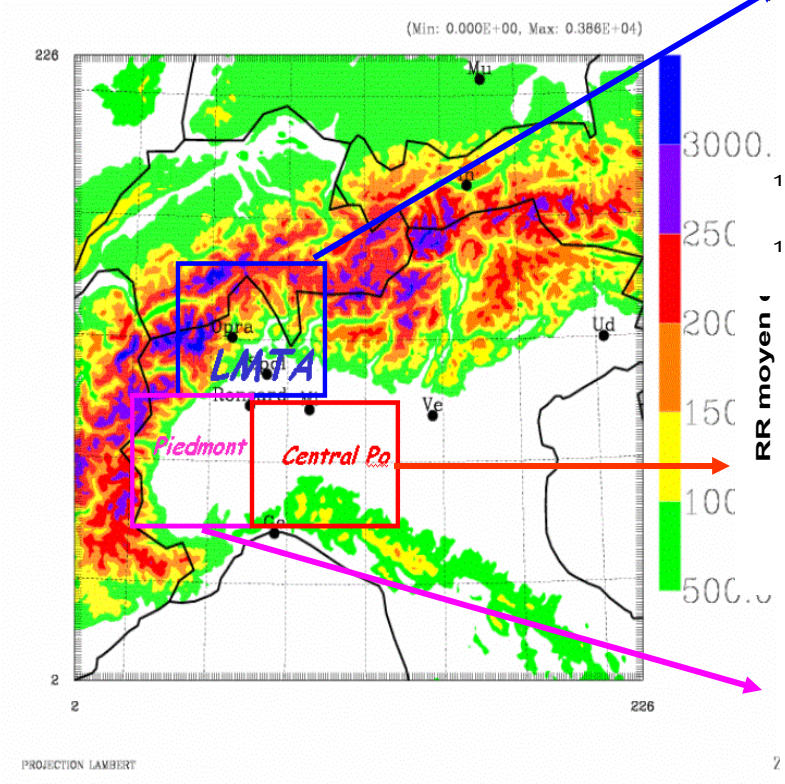
AROME Validation

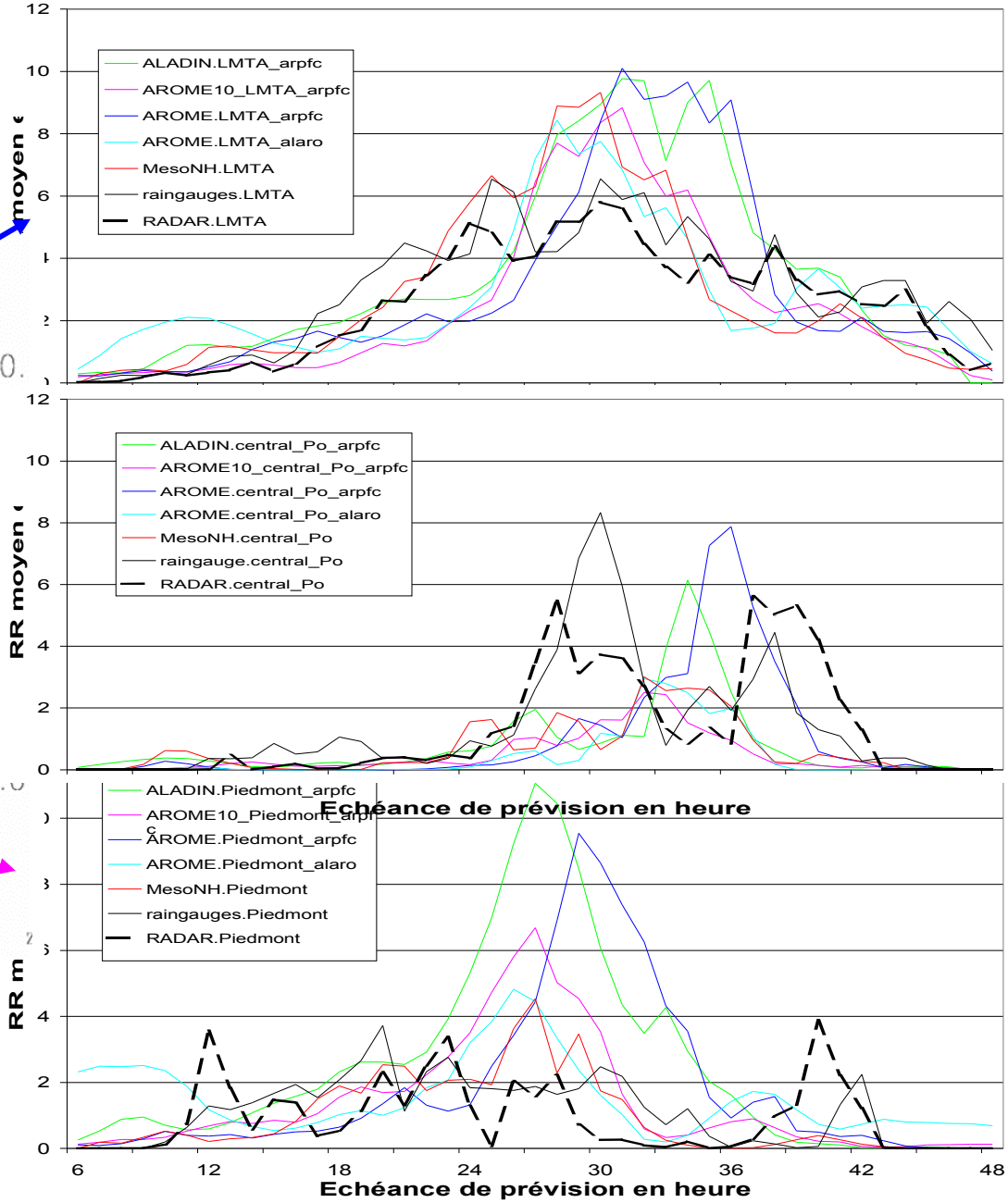
(1) 2.5 km

- ➔ MAP case (POI2b) and the sensitivity to the coupling conditions
- ➔ Routine forecasts (starting SW of France)
- ➔ Storm events
- ➔ AROME outside France
  - ➔ Roumanian case
  - ➔ Hongarian Arome

AROME validation

MAP IOP2b: sensitivity to the coupling model

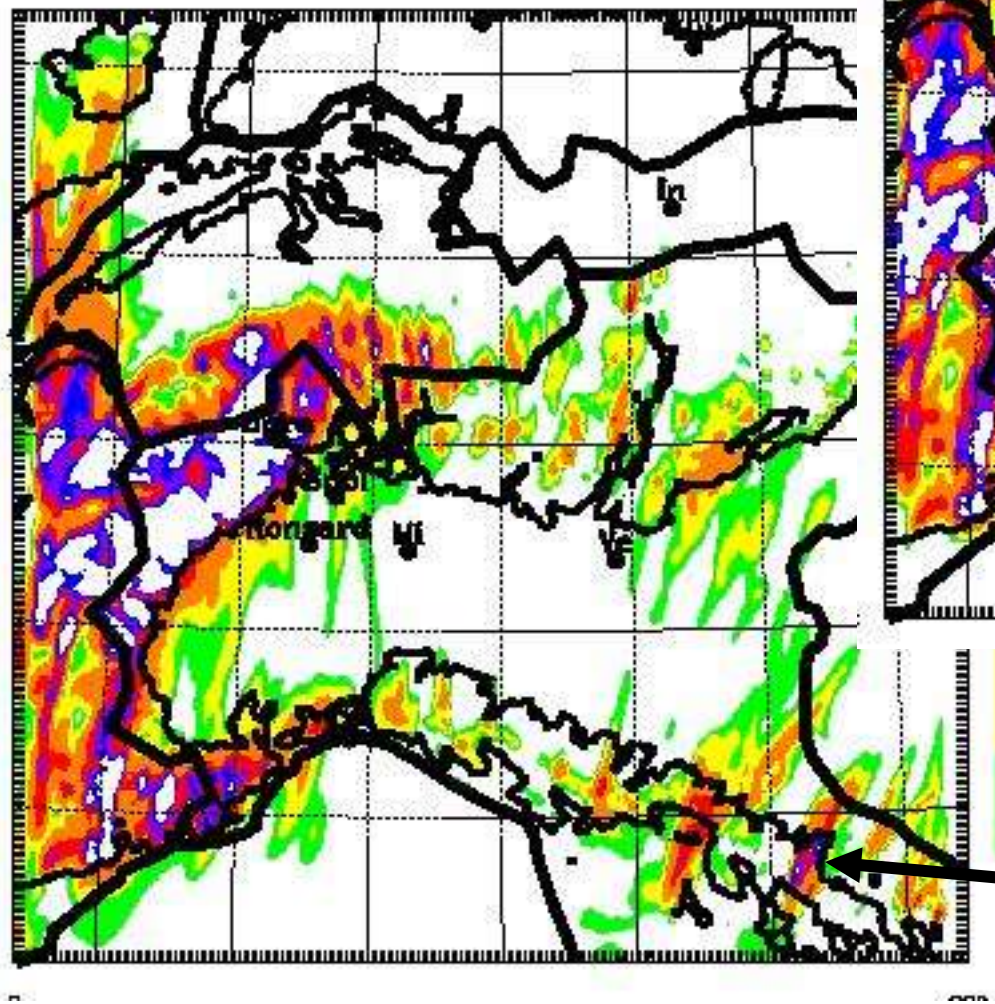


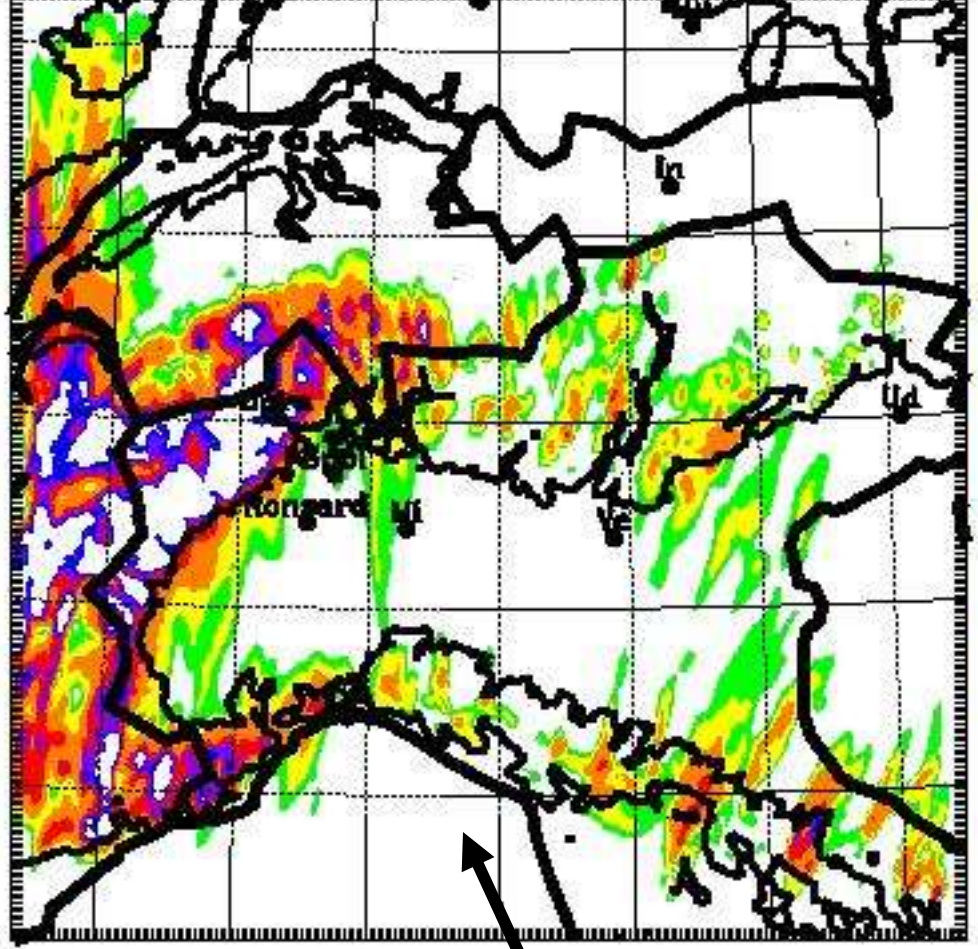


AROME validation MAP

IOP2b coupling or not

coupling rx species ?





10.00

No coupling

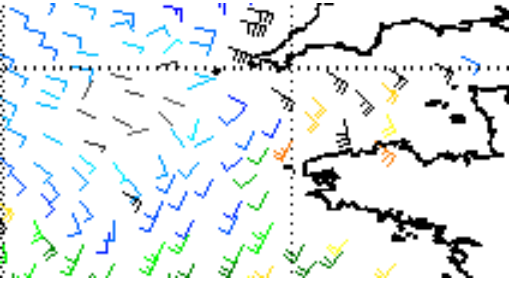
coupling

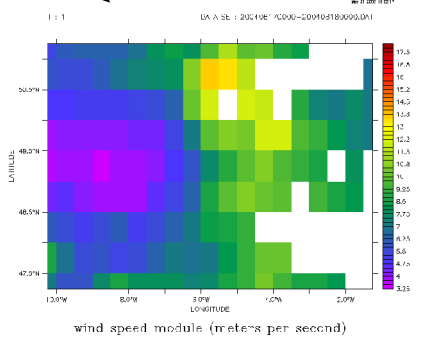
19/09/99 +24h

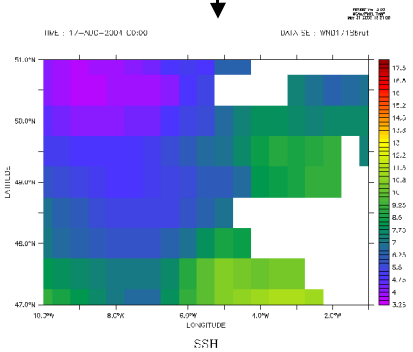
Arome validation –storm events (marine coastal purpose)

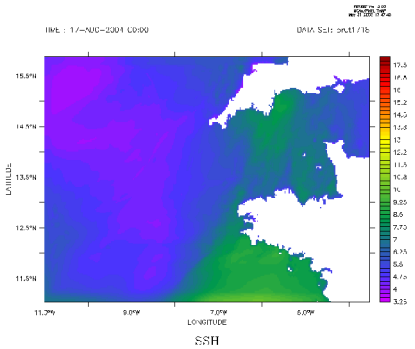
Quickscat **Arpège** **Arome**

17/08/2004

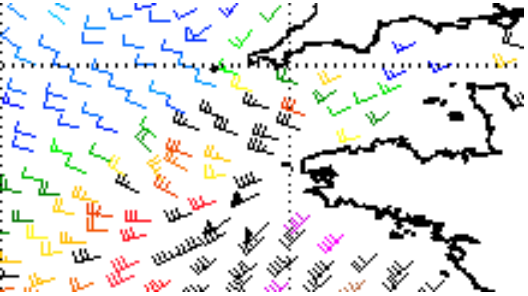


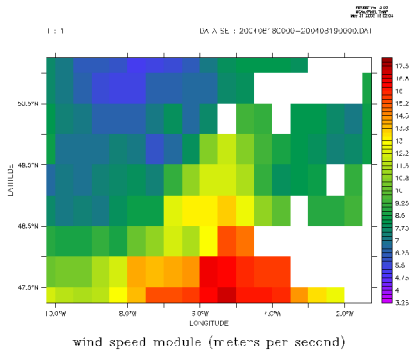


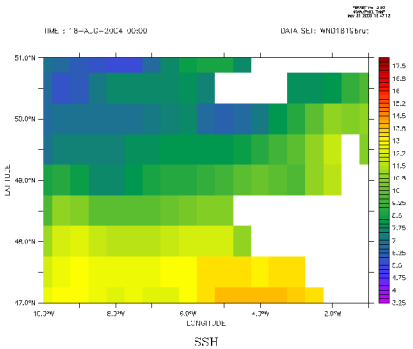


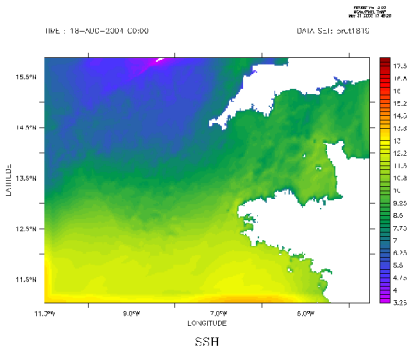


18/08/2004

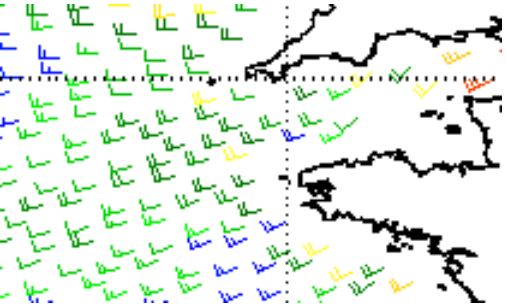


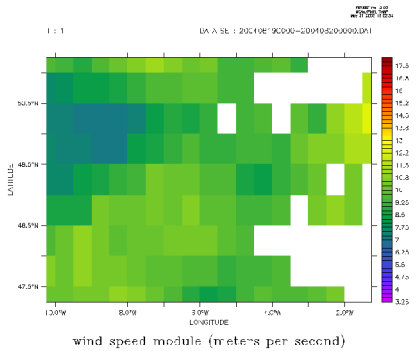


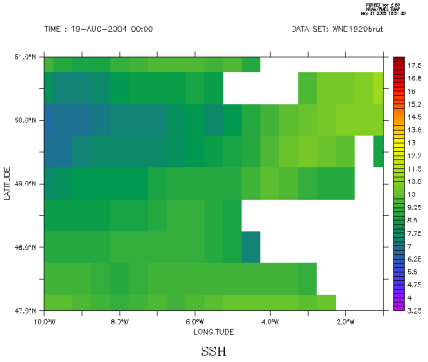


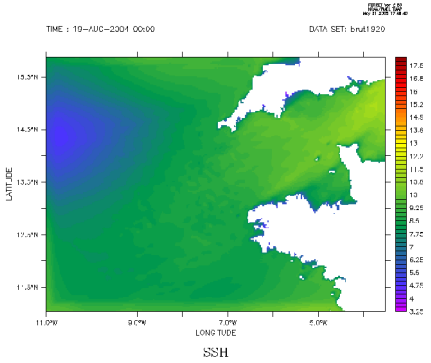


19/08/2004







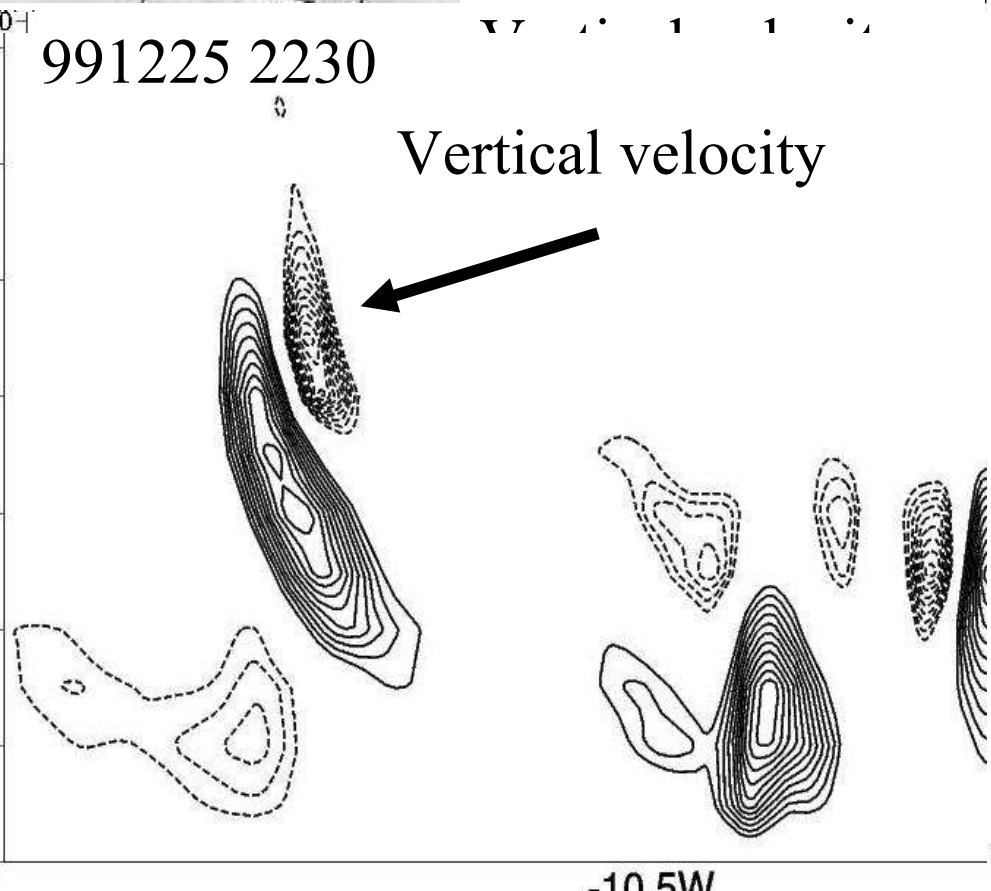


2200 UTC

Dry intrusion Storm « T1 »

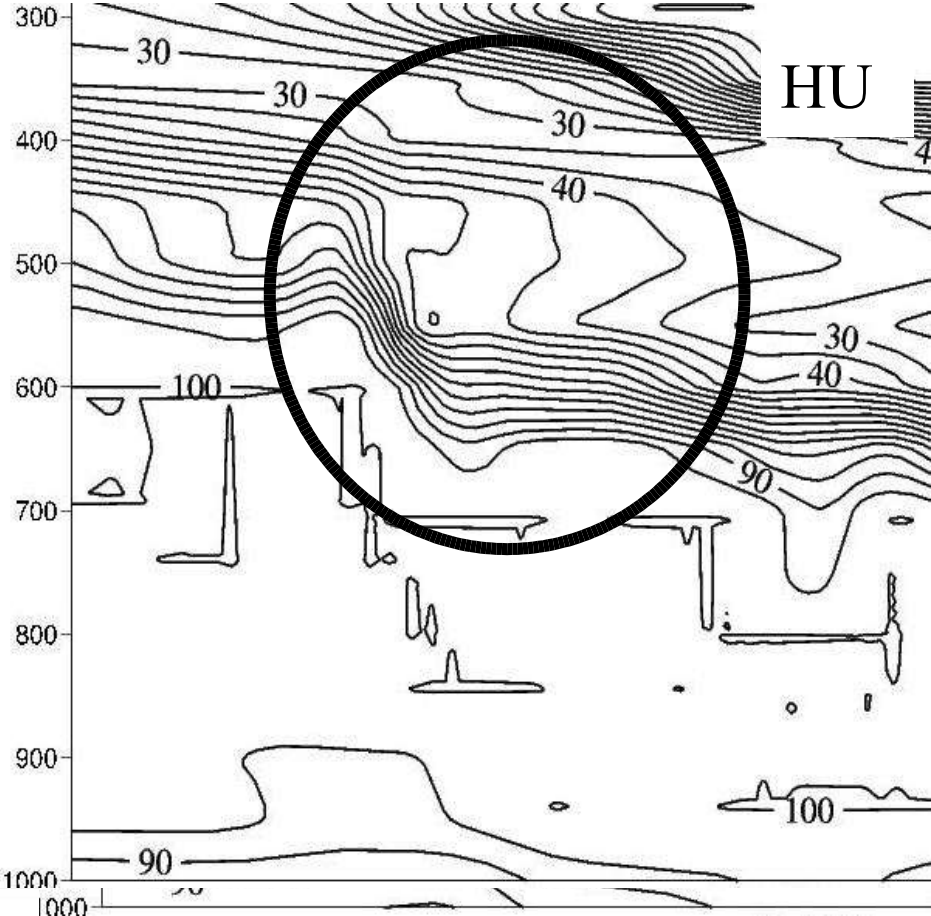
2230 UTC

Arome 2.5 km



991225 2230

Vertical velocity

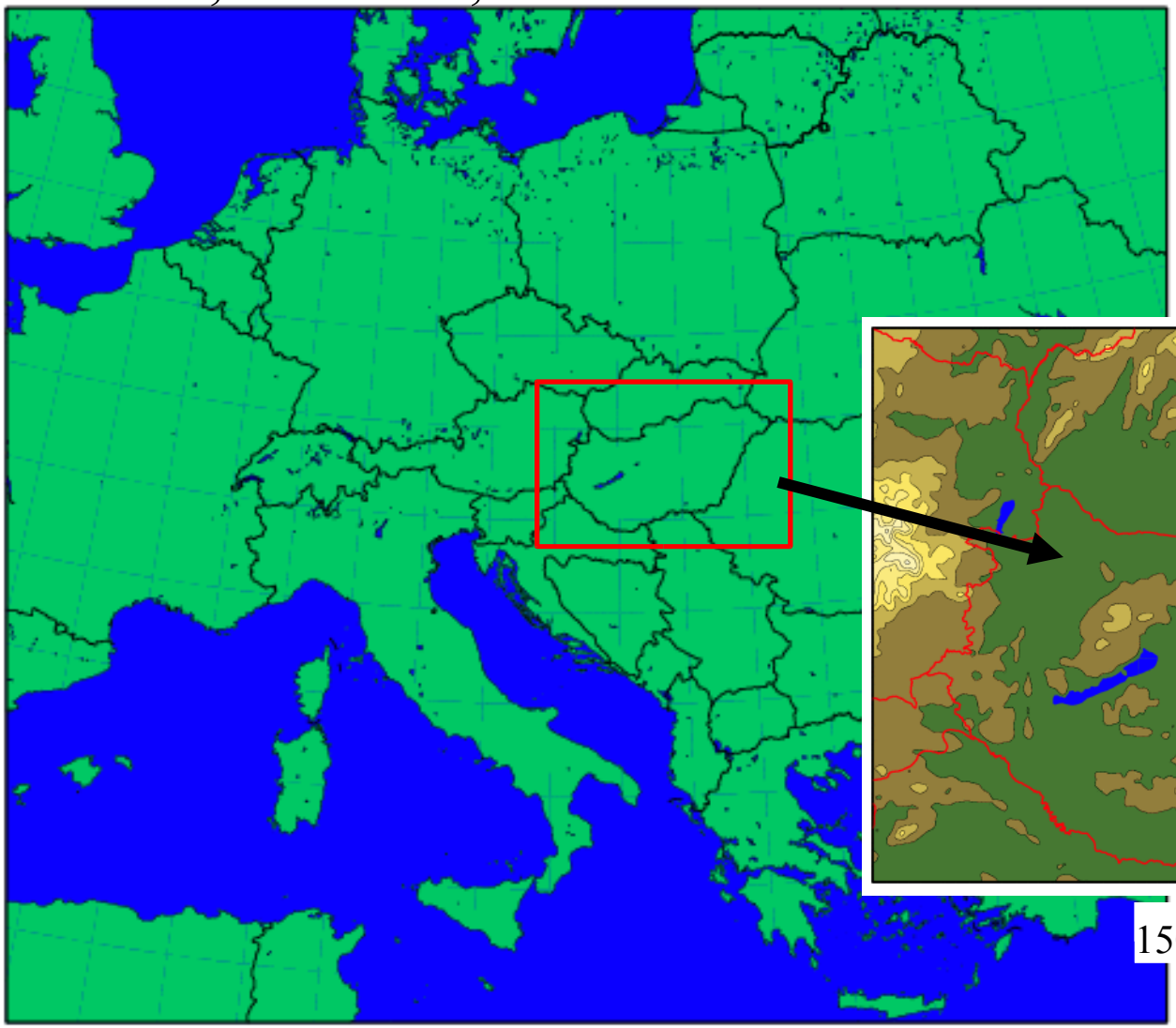


HU

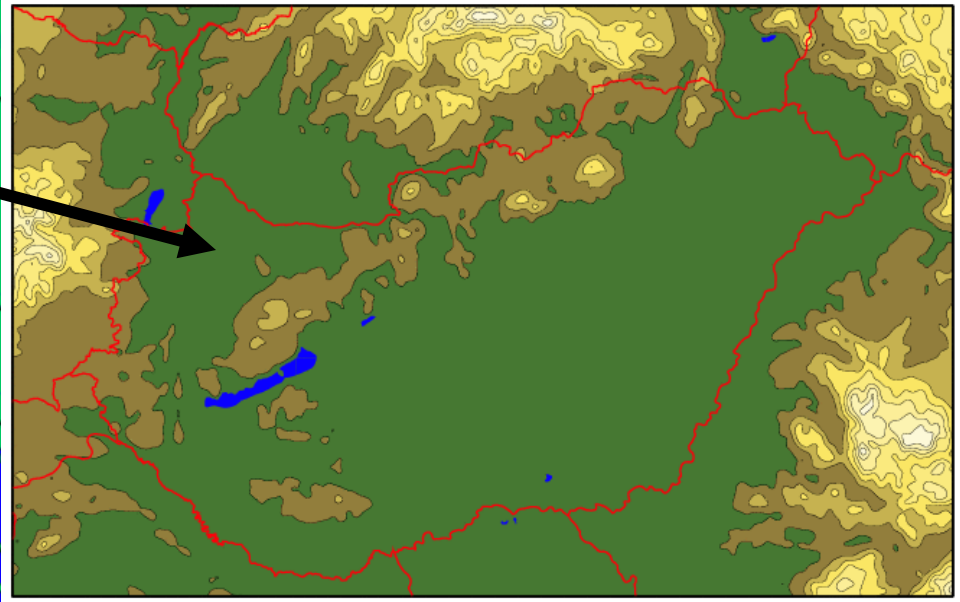
Arome outside: Hungarian Application

Aladin domain

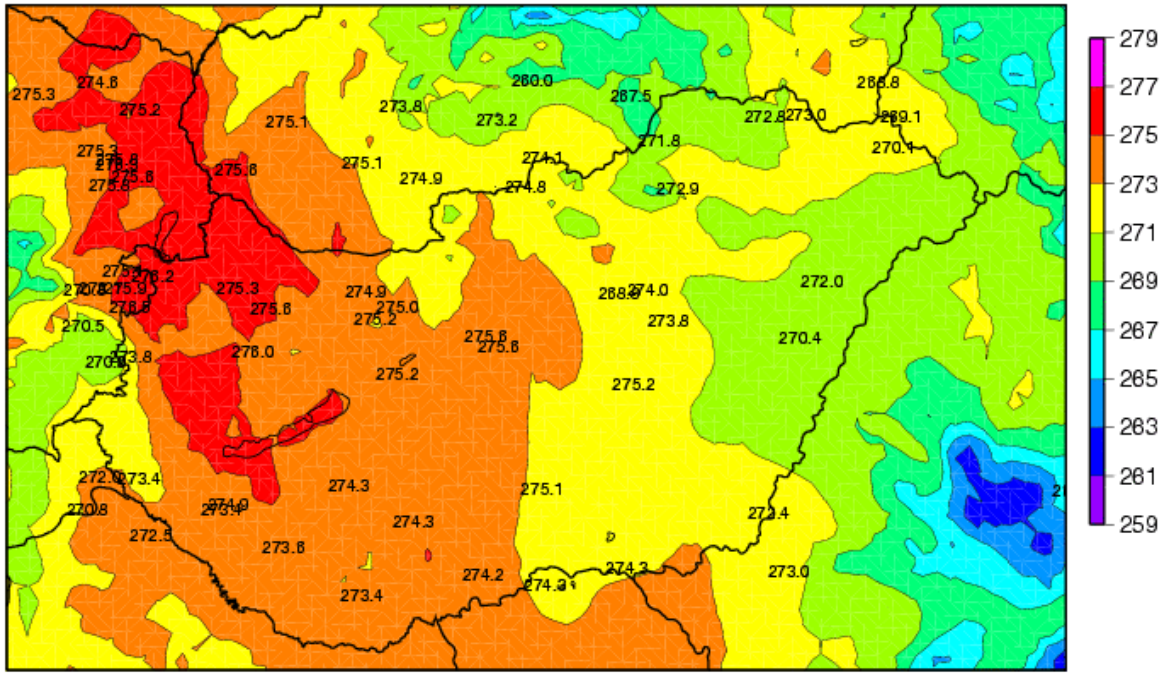
360x320, dx=8km, 49 vertical lev.



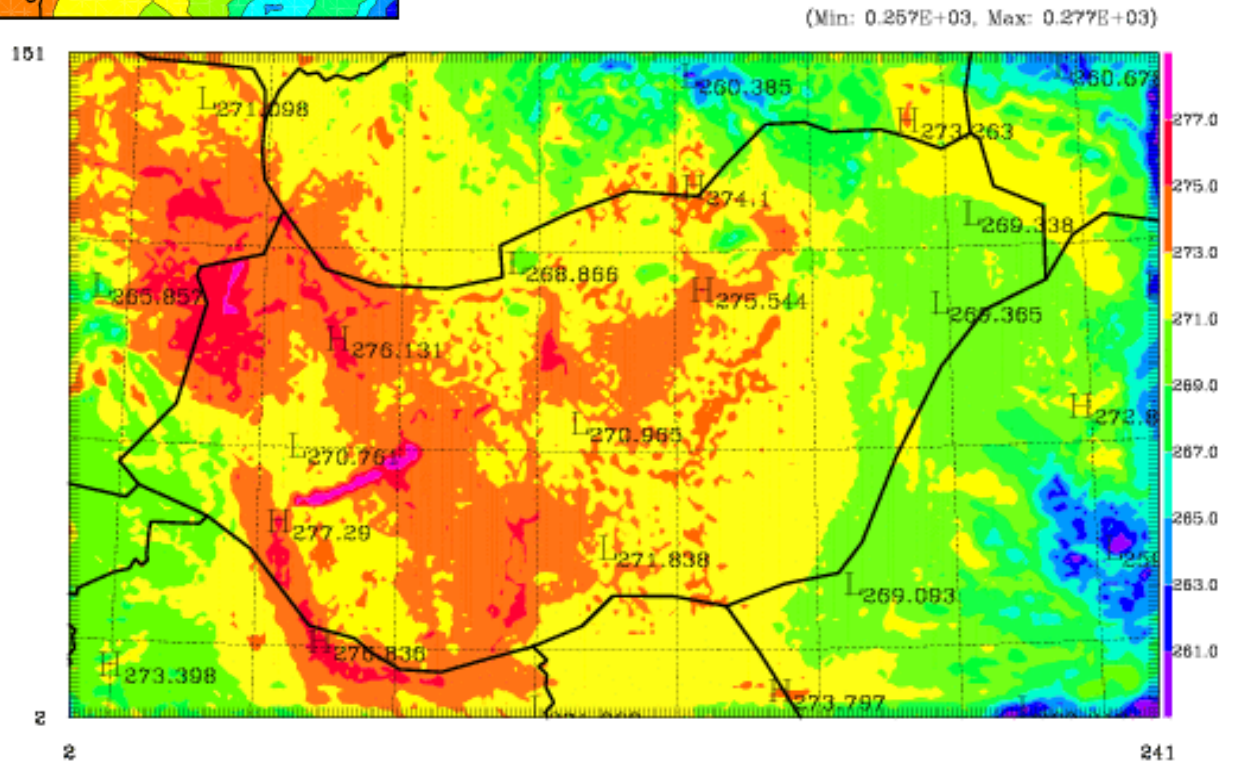
AROME domain



150x160, dx=2.5km, 49 vertical lev.

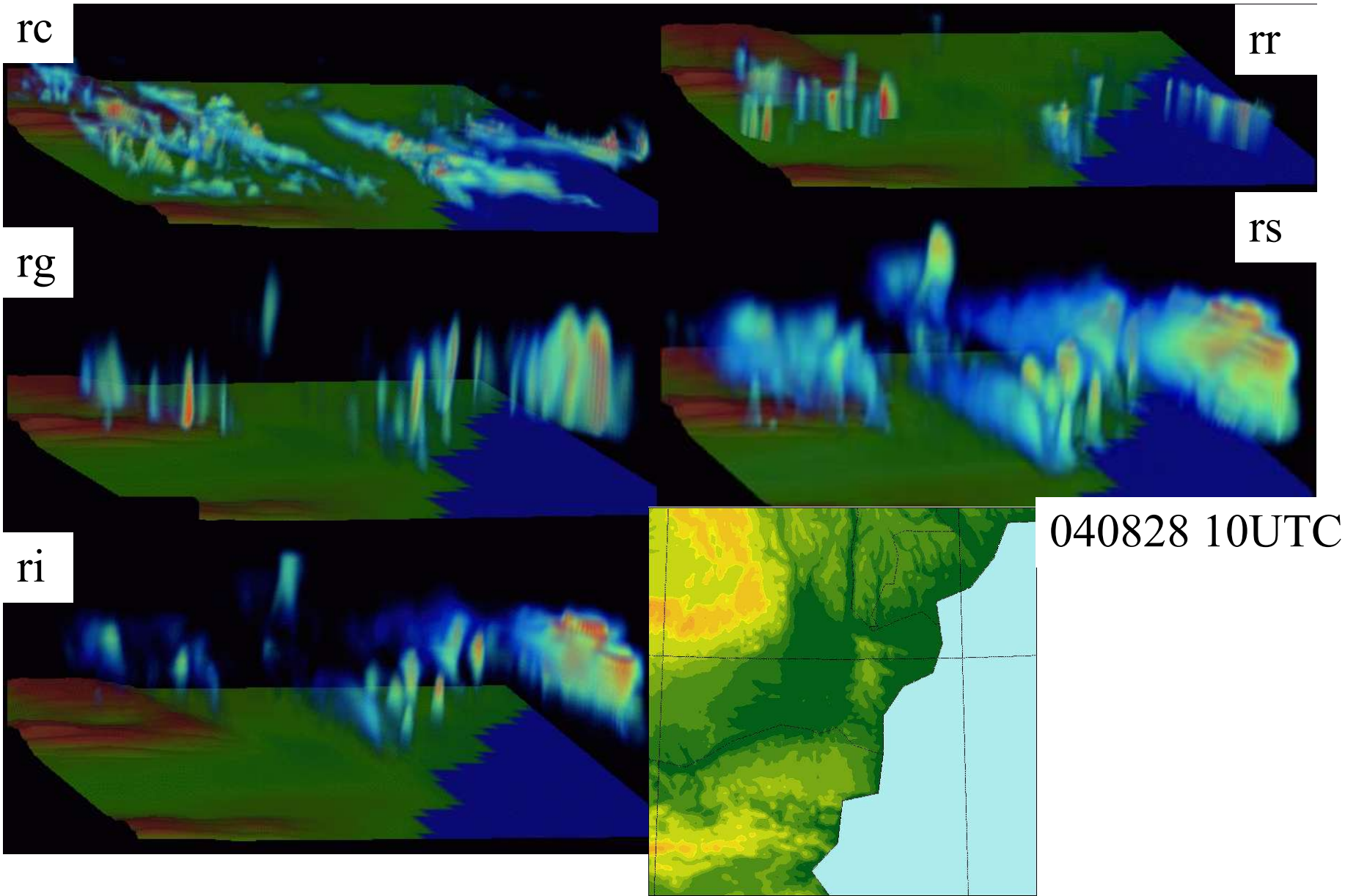


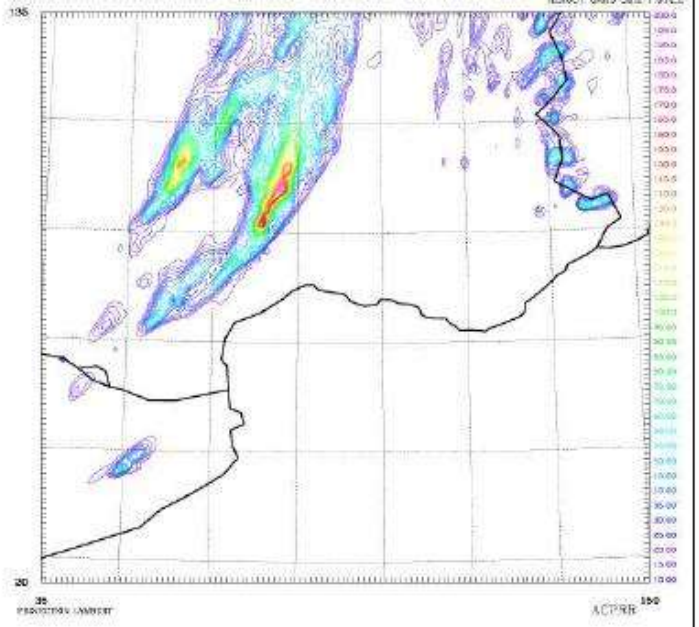
Coupling: T2m (24h)



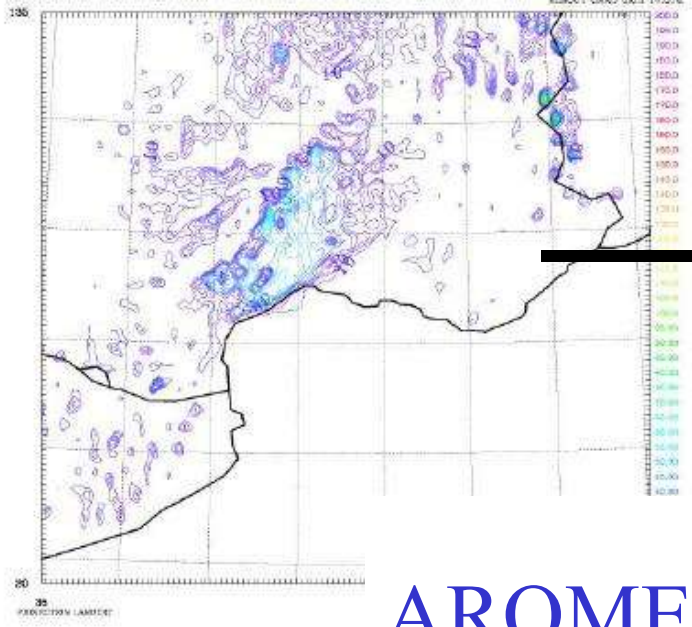
AROME: T2m (24h)

Arome outside: Roumanian application





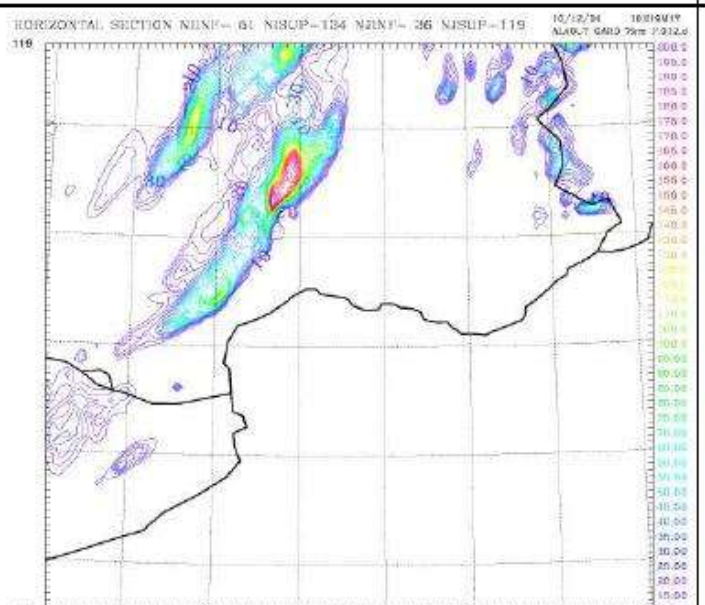
No conv
(left)

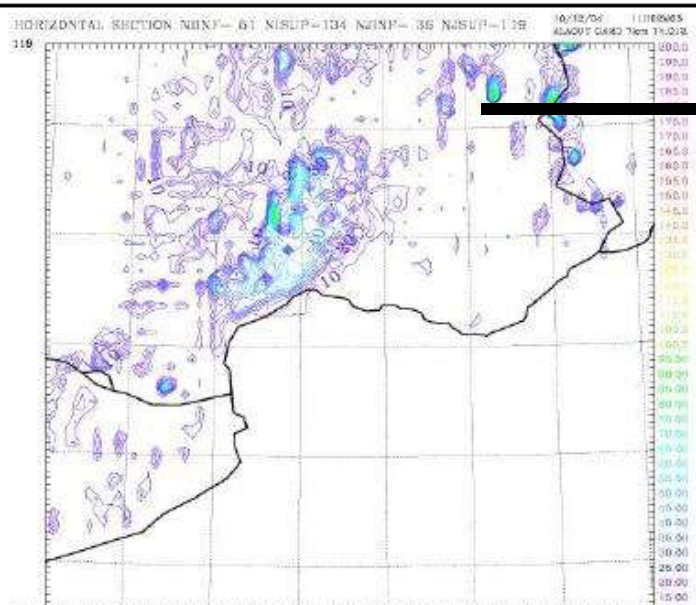


Conv
(right)

5 km
resolution

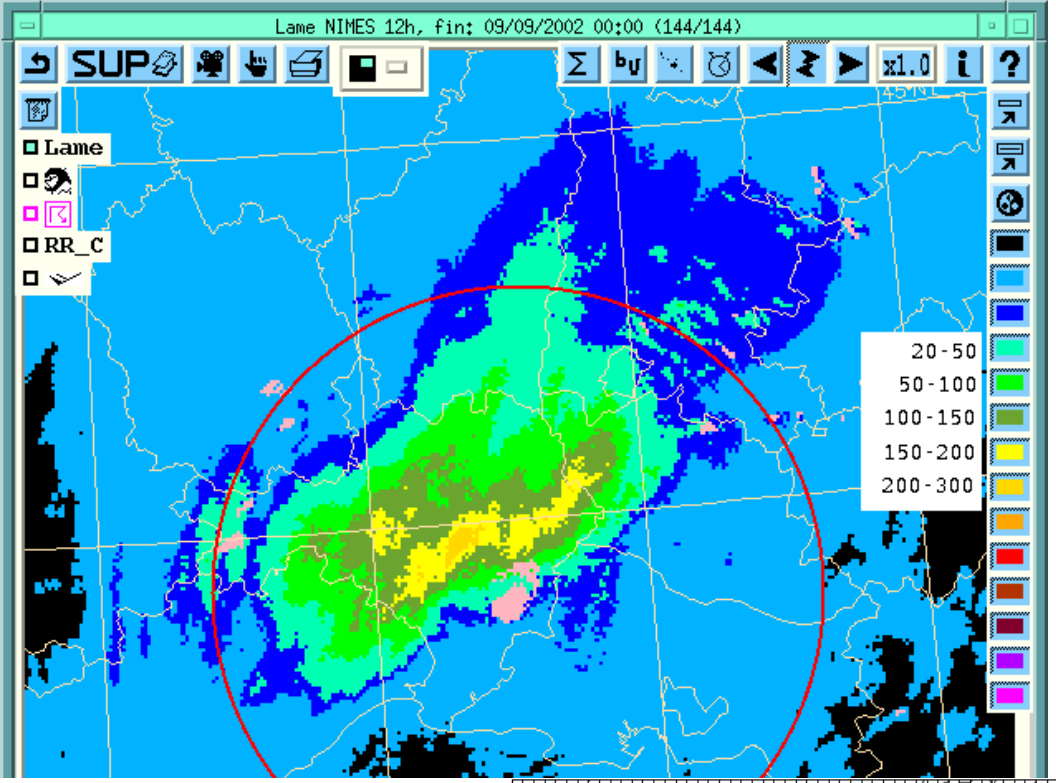
AROME
in the grey zone



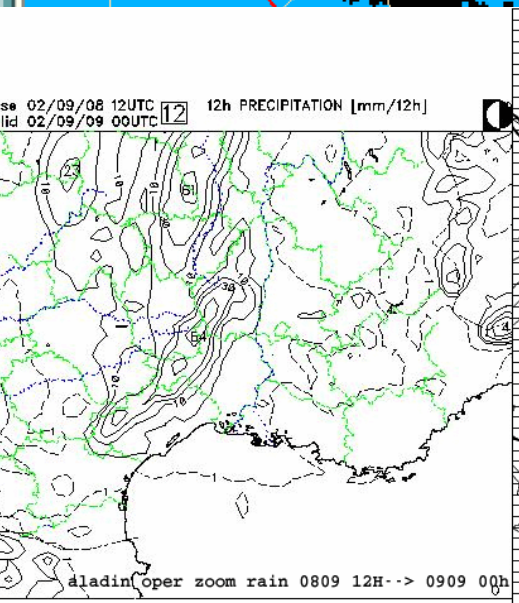


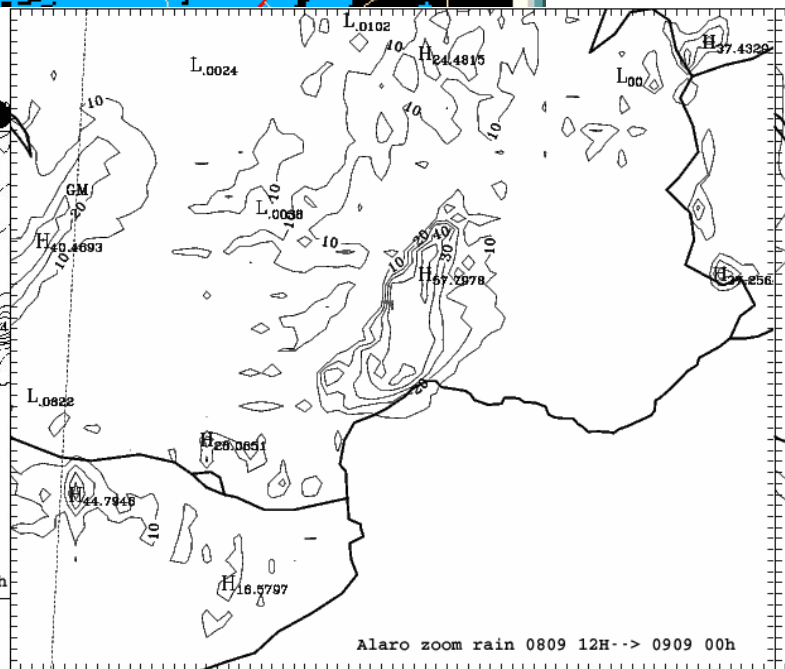
7 km

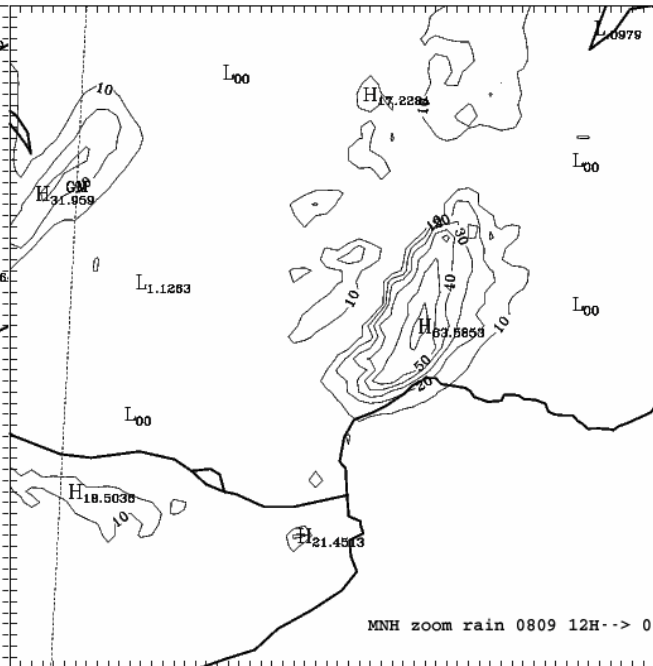
resolution



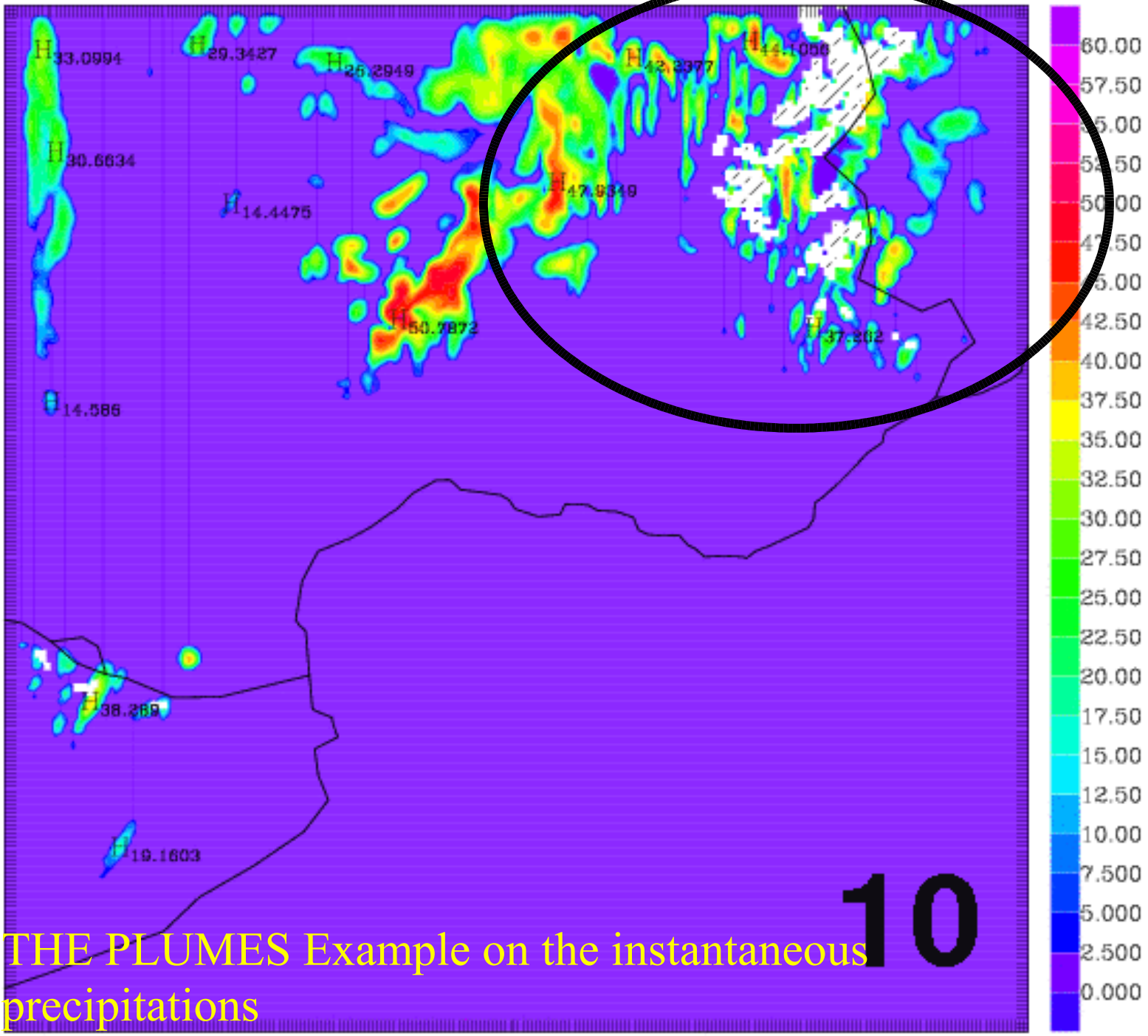
Arome at 10 km resolution








The identified problems
running AROME(until now …)

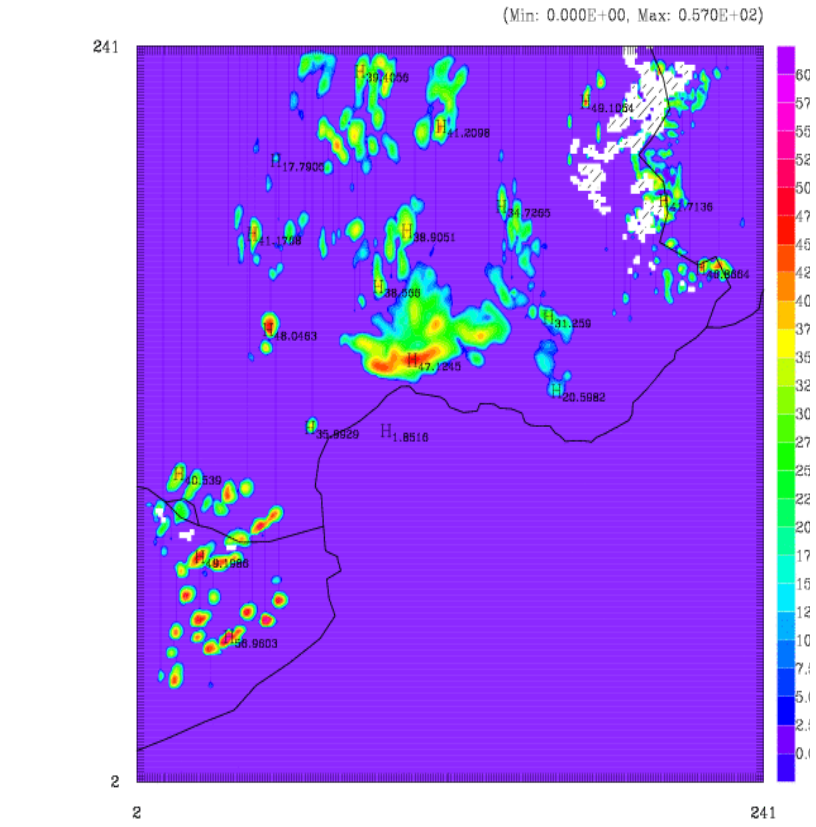


10

THE PLUMES Example on the instantaneous precipitations

HORIZONTAL SECTION NIINF= 2 NISUP=241 NJINF= 2 NJSUP=241 14/10/04 GARD+0060dg

AROME

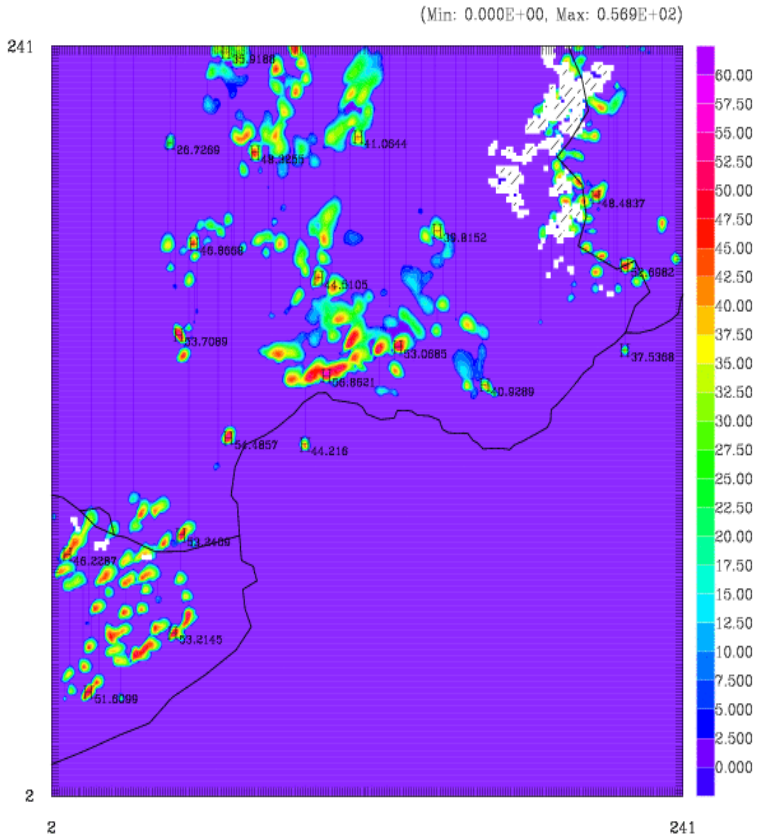


TIME = 0.
DATE MOD. 2002/ 9/ 8 12H 0M 0S DATE CUR. 2002/ 9/ 8 12H 0M 0S
DATE EXP.. 2002/ 9/ 8 12H 0M 0S DATE SEG. 2002/ 9/ 8 12H 0M 0S LAMBERT

RARE dBZ

HORIZONTAL SECTION NIINF= 2 NISUP=241 NJINF= 2 NJSUP=241 15/10/04 16H35M12 BOG12.1.SEG01.002dg.Z

Méso-NH



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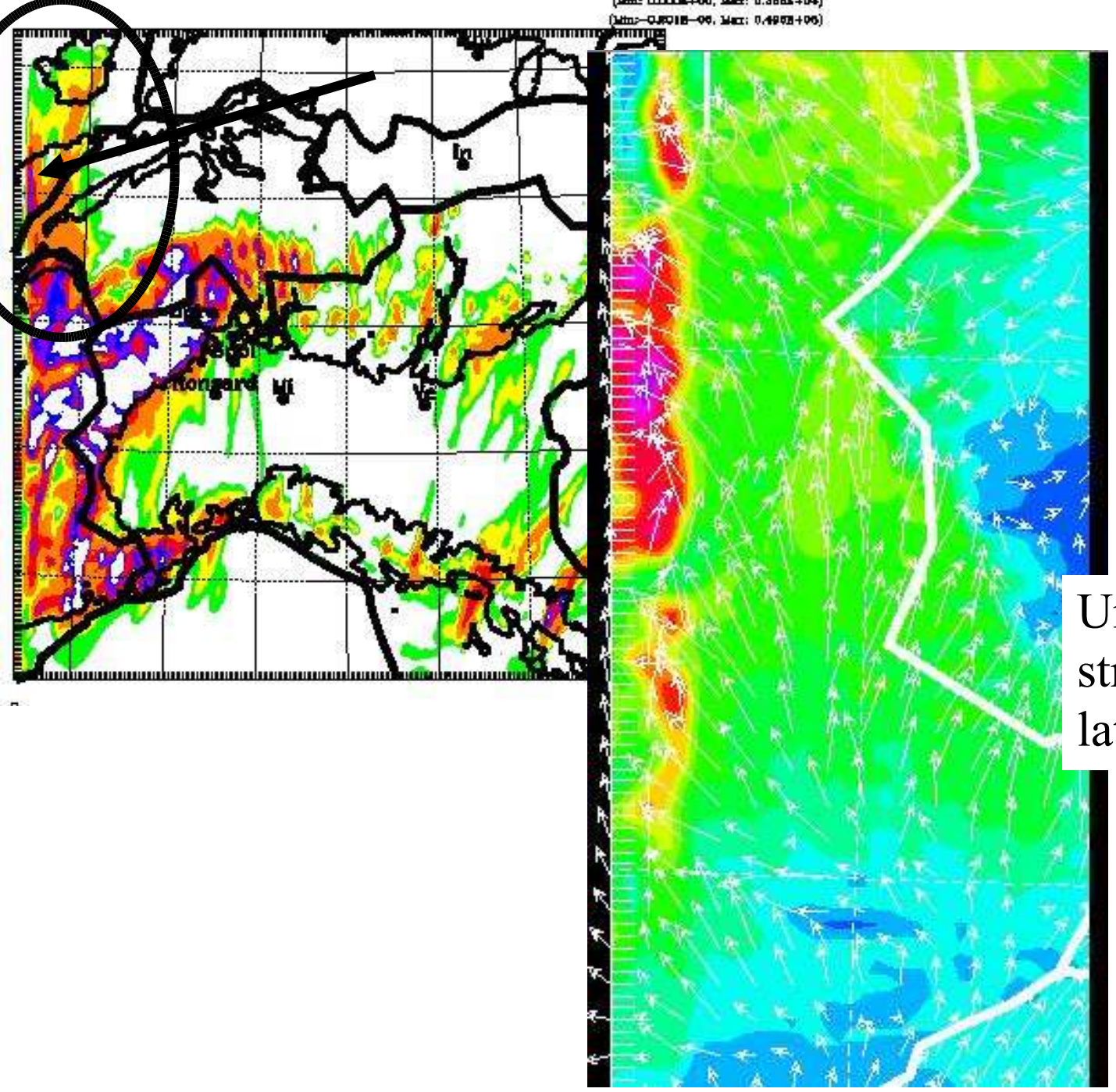
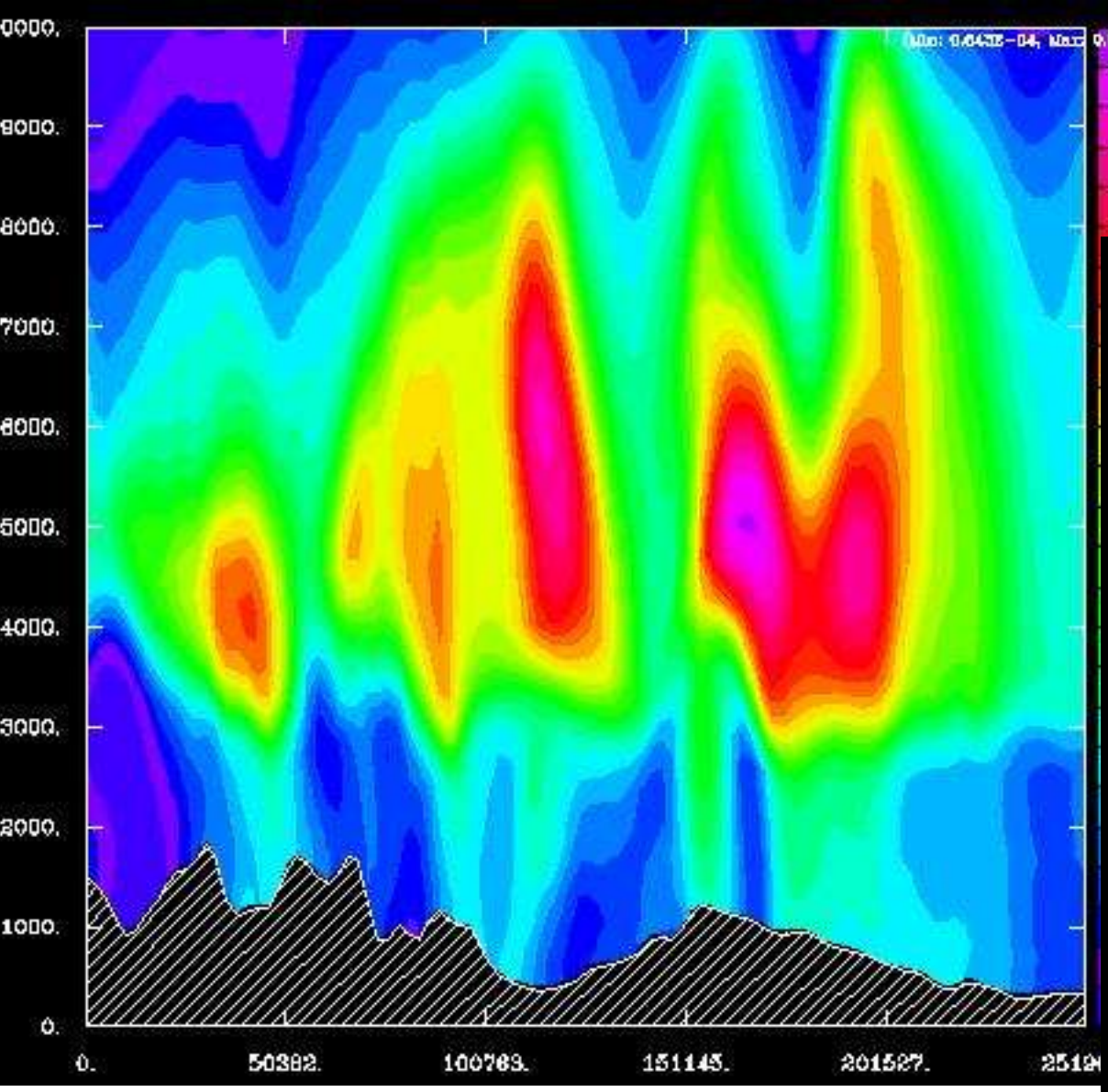
DATE EXP.. 2002/ 9/ 8 12H 0M 0S DATE SEG. 2002/ 9/ 8 12H 0M 0S LAMBERT

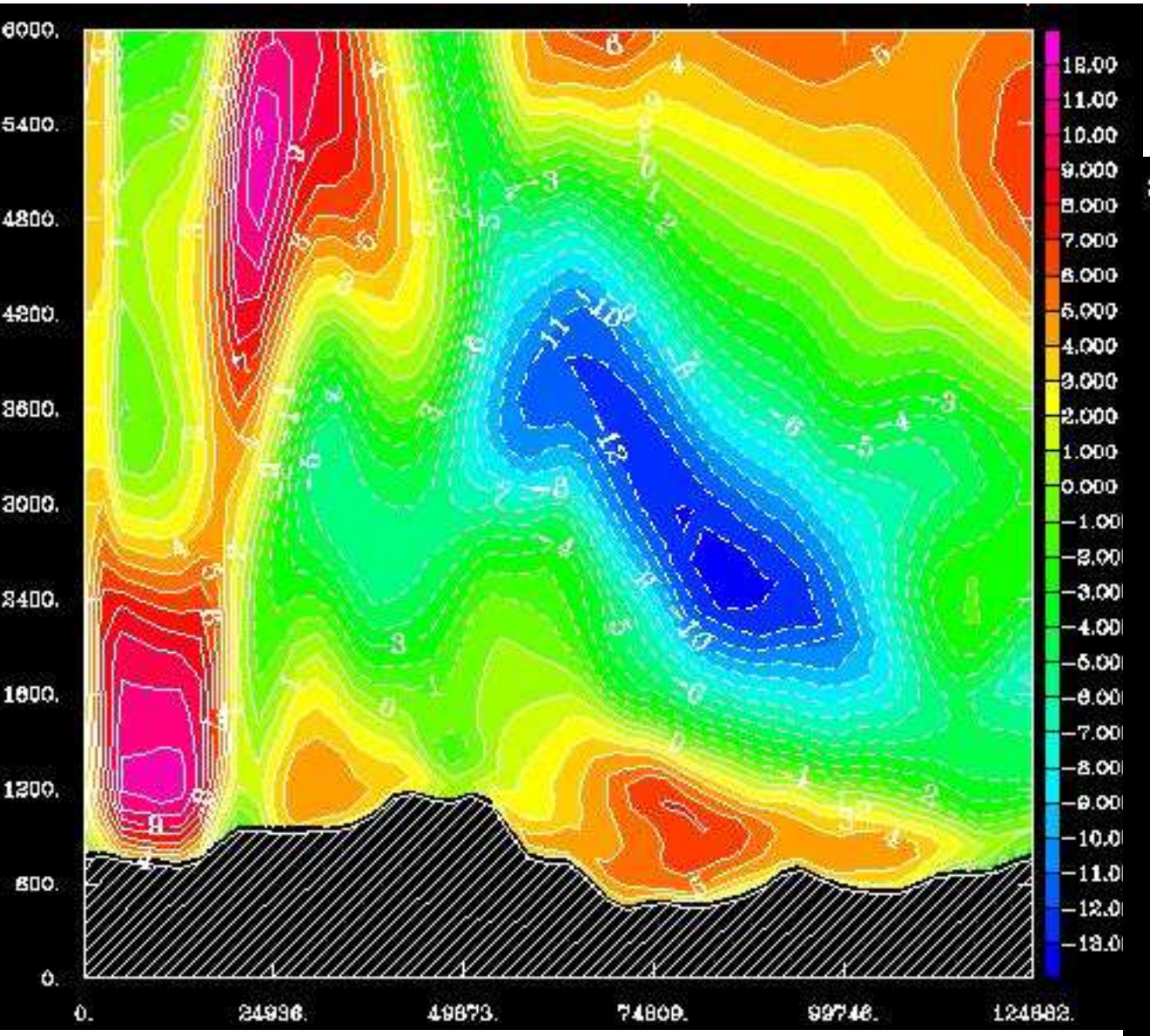
RARE dBZ Z= 2500



Unrealistic structures along lateral boundaries



Hydrometeors



As a consequence of strong wind convergence