

THE OPERATIONAL ALADIN-FRANCE MODEL : STATUS AND CHANGES

MAIN CHARACTERISTICS : very few changes for two years

Geometry

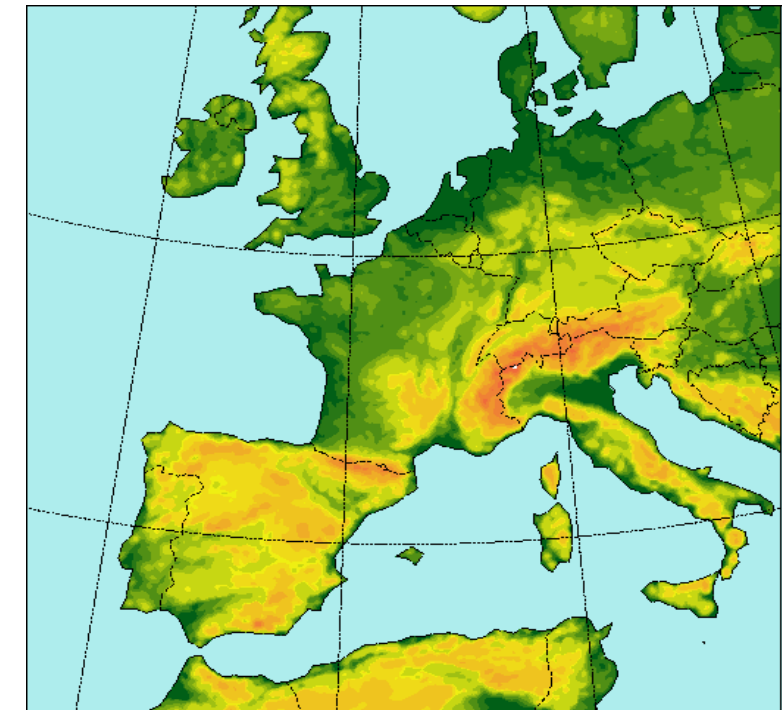
- ★ mesh-size : 9.5 km
- ★ spectral resolution : $E149 \times 149$ (linear truncation)
- ★ gridpoints : 288×288 (including the extension zone, 11 points wide)
- ★ vertical levels : 41
- ★ corners : SE [33.14°N; 11.84°W], NE [56.96°N; 25.07°E]

Running in dynamical adaptation mode

- ★ digital filter initialization + short-range forecast
- ★ time-step : 415.385 s
- ★ initial and boundary conditions from ARPEGE (*horizontal resolution ratio : ~3*)
- ★ synchronous 3h-coupling
- ★ post-processing every hour
- ★ **5 runs a day now :**
 - 00 UTC +36 h**, (*"very short cut-off", available early : 1h45 UTC*)
 - 00 UTC +54 h, (*"long cut-off"*)
 - 06 UTC +48 h,
 - 12 UTC +42 h,
 - 18 UTC +36 h
- ★ total CPU time : ~ 8 hours per day (*running on 1, 3, or 5 processors*)

Else

- ★ hourly diagnostic analyses for nowcasting, based on O.I. (Diag-Pack)
- ★ providing coupling files for ALADIN-Belgium, every 3h
- ★ forcing a coastal wave-model (of resolution 0.1°)
- ★ parallel suites, with 1 forecast per day (from 00 UTC, up to 48h)



CHANGES ALONG THE LAST YEAR

2004, January 29th

- ◆ changes in the coupling model, mainly (4d-var) !
- ◆ use of monotonic semi-Lagrangian interpolators in dynamics
- ◆ changes in physics : reduction of snow-melting / rain-evaporation speeds, tuning of the convective cloudiness diagnostic, cleaning and speed-up of the radiation code, new computation of mixing lengths (a step towards interactive ones), improved robustness to changes in vertical resolution, new tuning parameters for cloud condensates et cloudiness.

2004, February 10th

- ◆ additional 36 h forecast from 00 UTC

2004, May 24th

- ◆ changes in the coupling model (4d-var and surface analysis)
- ◆ new, intermittent, radiation scheme : FMR15 (*"old Morcrette scheme", called every hour*)
- ◆ improved cloudiness (less 0/1, more ice $\Rightarrow$ *more cirrus*)

Similar changes as in ARPEGE up to now.

SCHEDULED CHANGE, WITHIN 2005 : IMPLEMENTING A 3D-VAR ASSIMILATION SUITE

Cycling :

- Coupling to ARPEGE analyses and 3 h forecasts
- Strong digital filter initialization (*stop-band edge period : 3 h*)
 - $\rightarrow$ to be reconsidered after sensitivity experiments (no, weaker filter ?)

Surface :

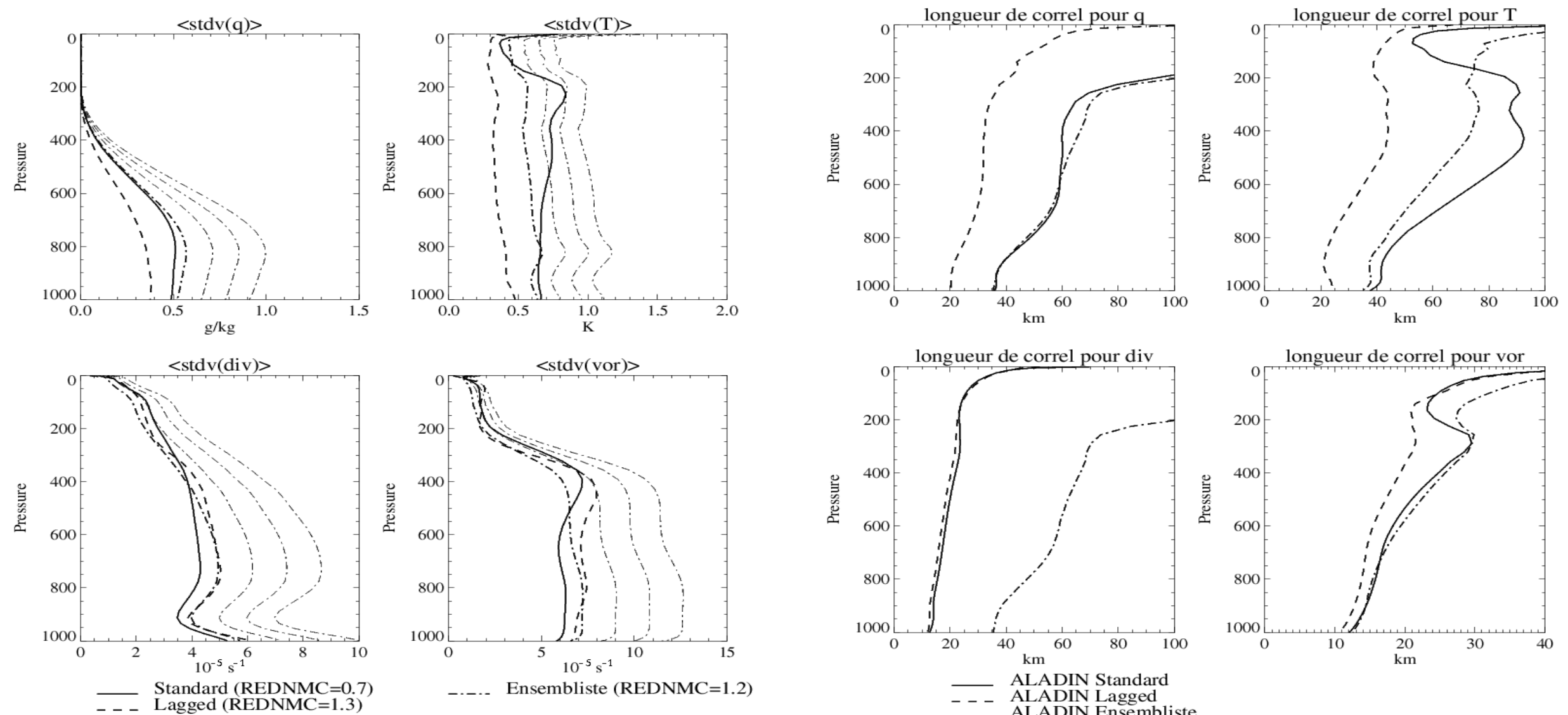
- Interpolation of initial ARPEGE fields on the ALADIN grid
- Before 3D-Var
 - no surface blending nor soil/surface assimilation
 - "simple" solution

Jb :

Ensemble background error statistics, derived from ARPEGE ones (with the "perfect model" hypothesis) (*work of Simona Stefanescu*)

Scaling factor 1.8

→ intermediate between "standard" and "lagged" NMC statistics :



→ successful in suppressing a systematic large-scale bias in ALADIN (only) analyses (*on T, above 300 hPa*)

Jo :

Similar observations as in ARPEGE (*SYNOP, TEMP, AIREP, TOVS – including AMSUU-A and HIRS - with ARPEGE bias correction, ...*)

Hardly any retuning

Experiments with MSG/SEVIRI data : *resolution 25 km, thinning distance 66 km, 6 channels (IR)*

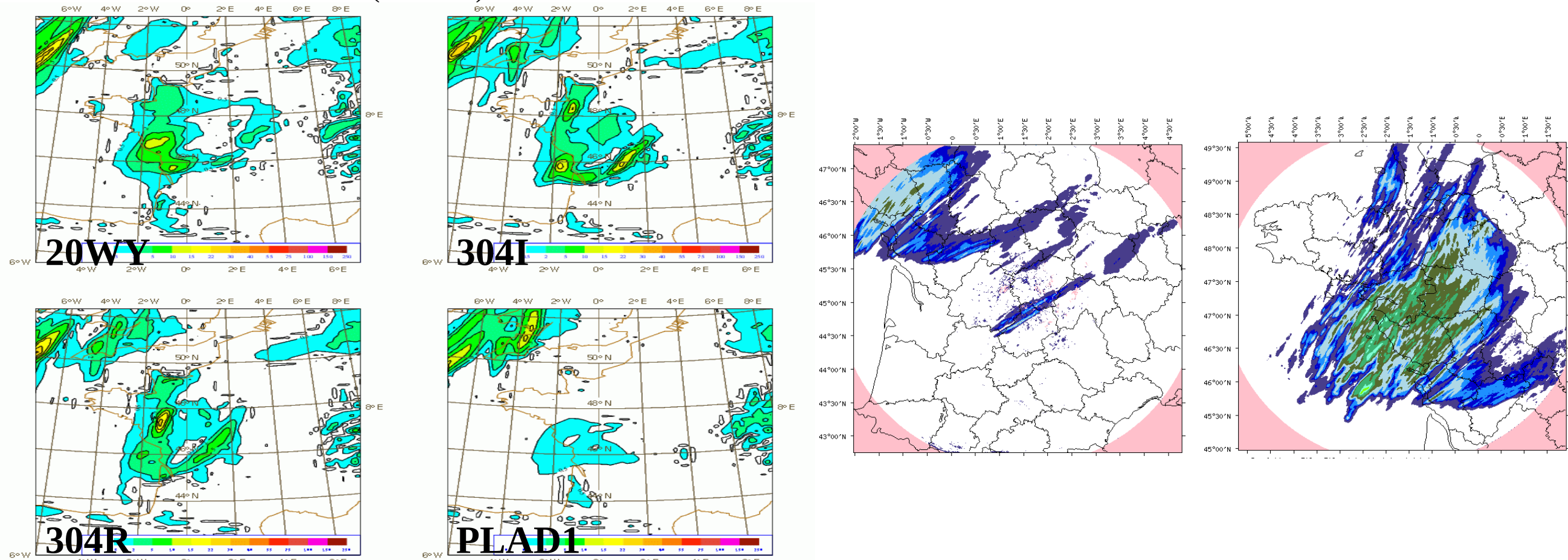
First results :

Test configuration,a 17-days assimilation experiment

18/07/2004 12 UTC, 6h cumulated precipitations (06-12 UTC)

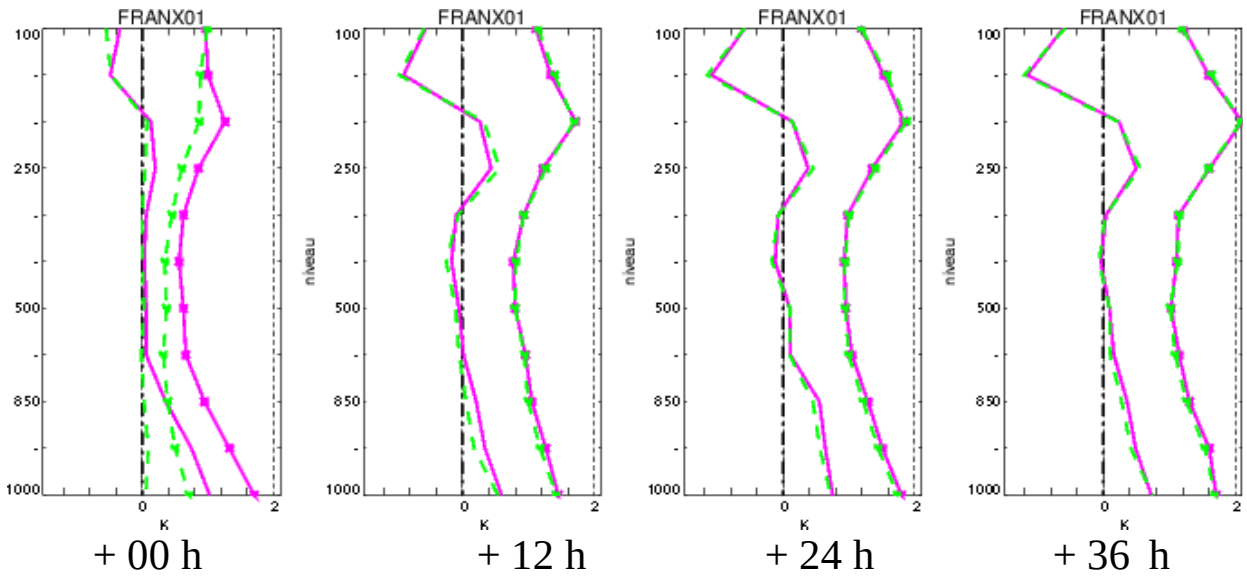
Forecasts (P12 – P6)

Observations



20WY :3D-Var, lagged Jb ; 304I : 3D-Var, ensemble Jb ; 304R : 3D-Var, ensemble Jb, no dfi ; PLAD1 : dynamical adaptation / Grèzes and Nantes radars

Scores against TEMP observations, 3D-Var versus dynamical adaptation



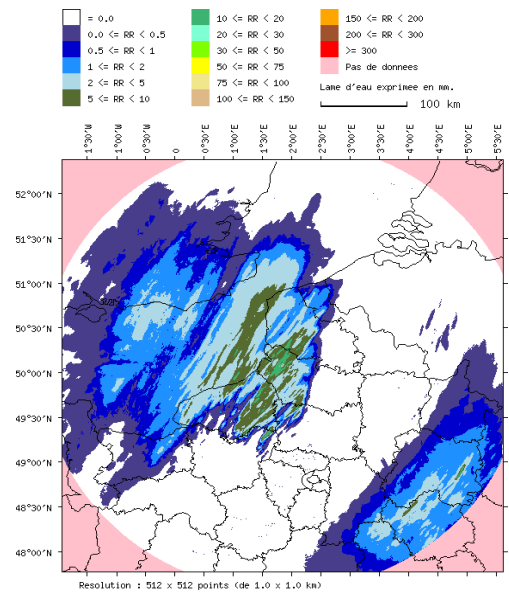
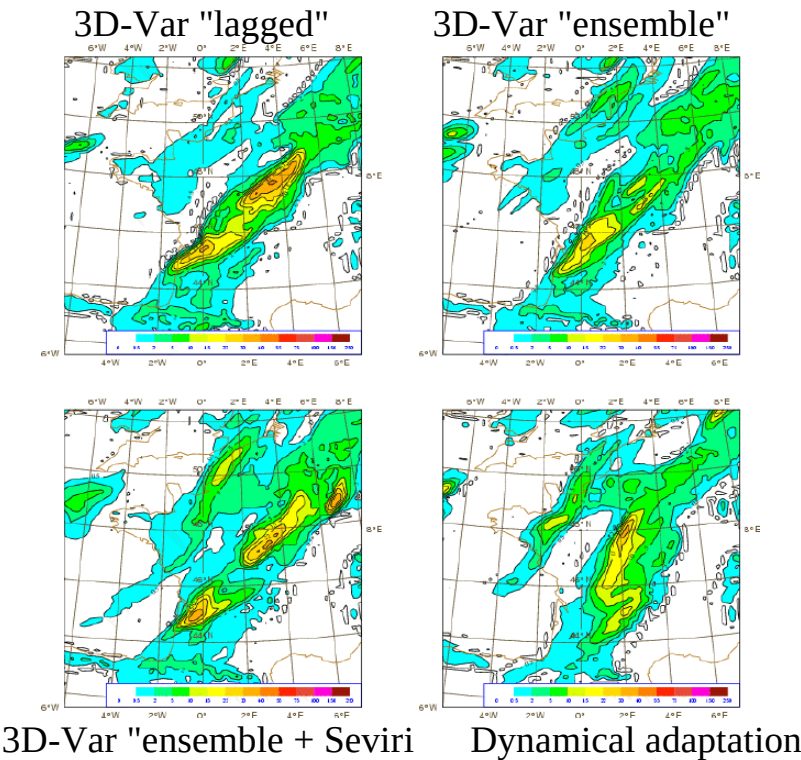
16 days, Temperature,

Impact of MSG/SEVIRI observations : a 12-days assimilation experiment

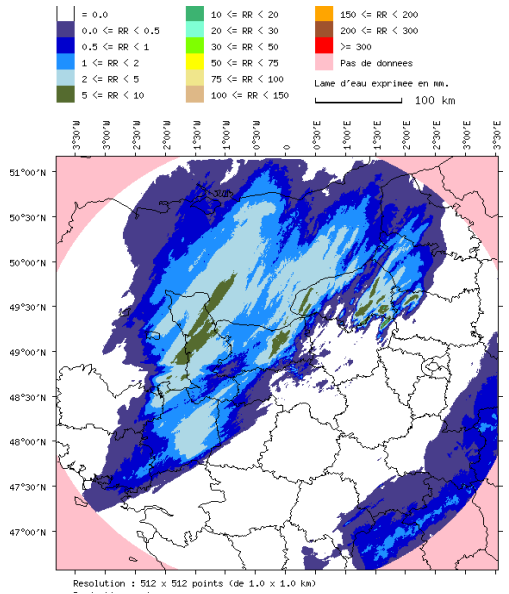
18/07/2004 12 UTC, cumulated precipitations 06-12 UTC

Forecasts

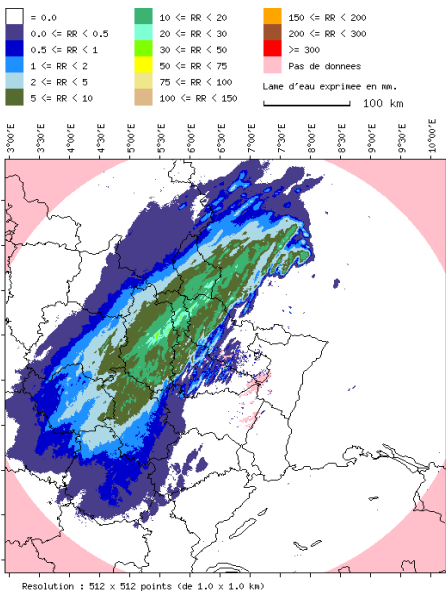
Observations



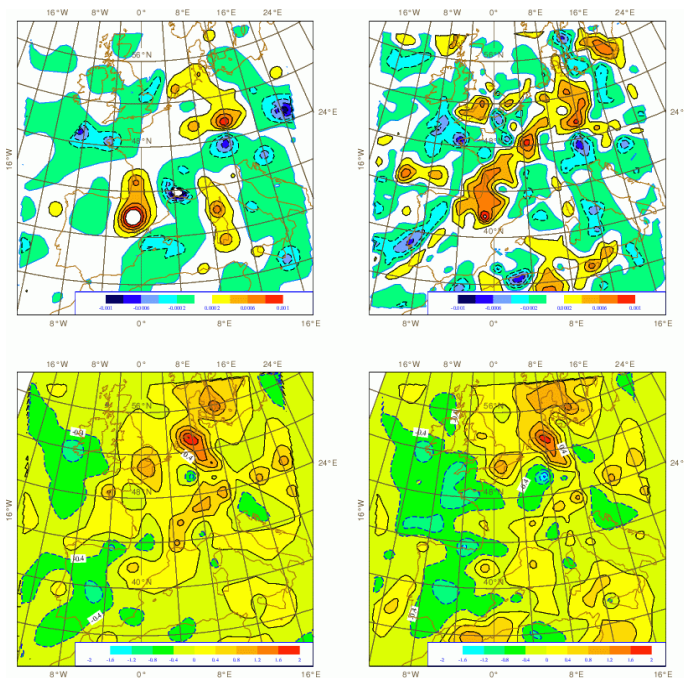
Caen



Abbeville

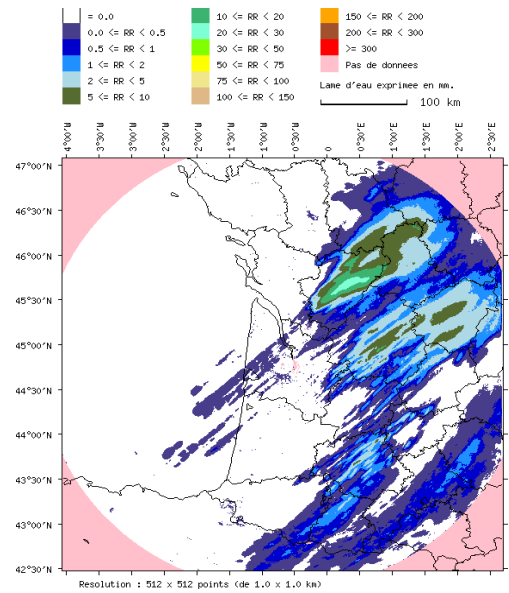


Nancy

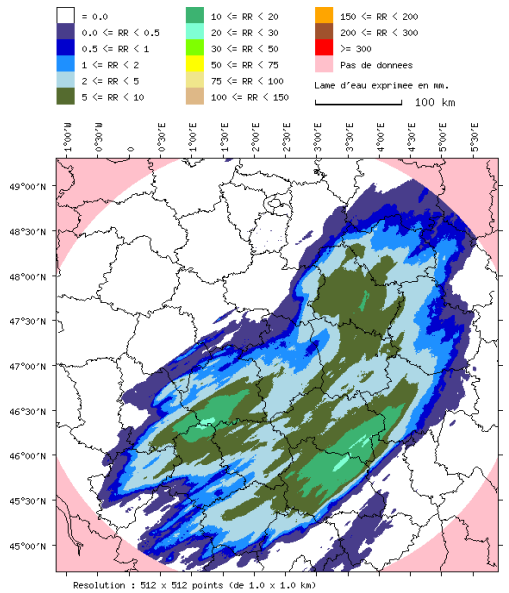


Analysis increments at 500 HpPa

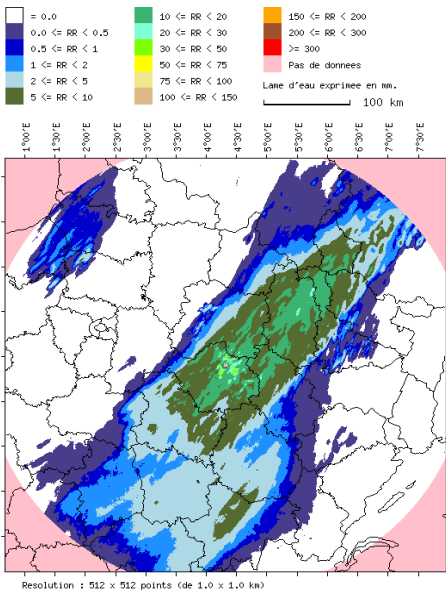
top: q, bottom : T/ left without, right : with Seviri data



Bordeaux



Bourges



Troyes

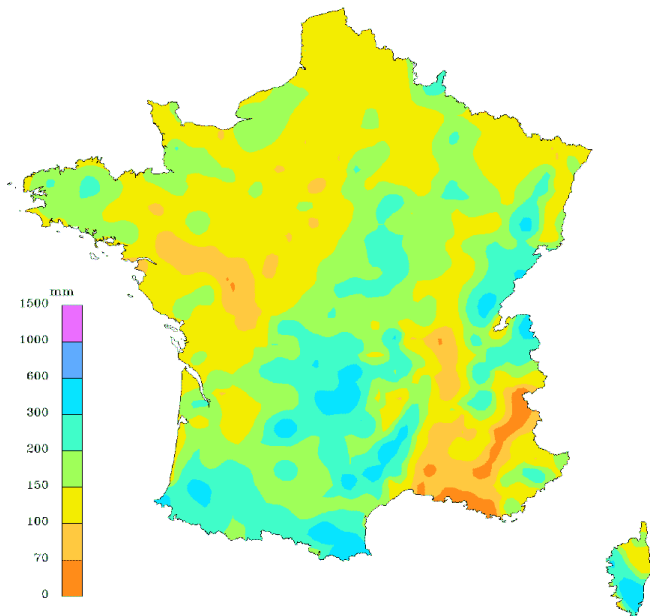
More details : Claude Fischer, Thibaut Montmerle and Loïk Berre, CNRM/GMAP (claud.fischer@meteo.fr, thibaut.montmerle@meteo.fr loik.berre@meteo.fr)

FORECAST SKILL

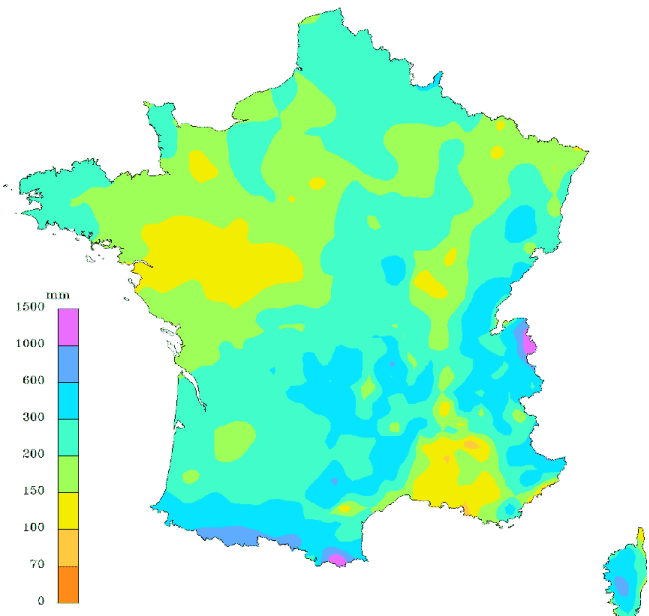
Still problems : too much precipitations, both in ARPEGE and ALADIN-France,

24-h cumulated rainfalls, from J 06 UTC to J+1 06 UTC (cumul aver the second quarter of 2004)

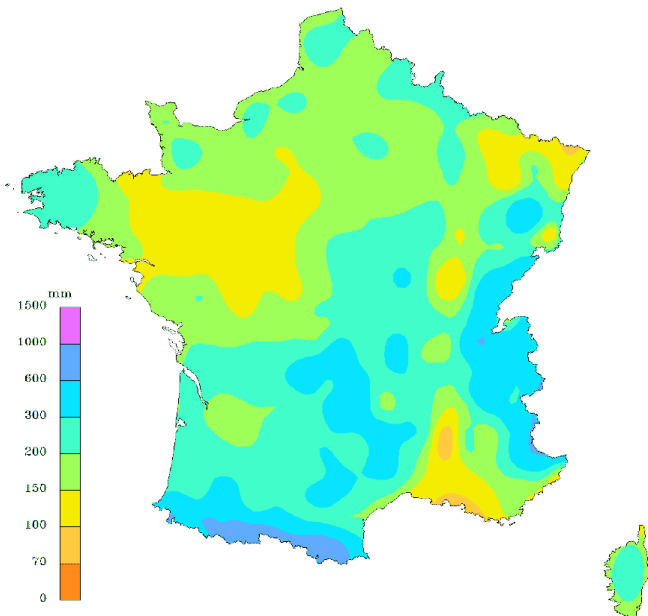
Observations



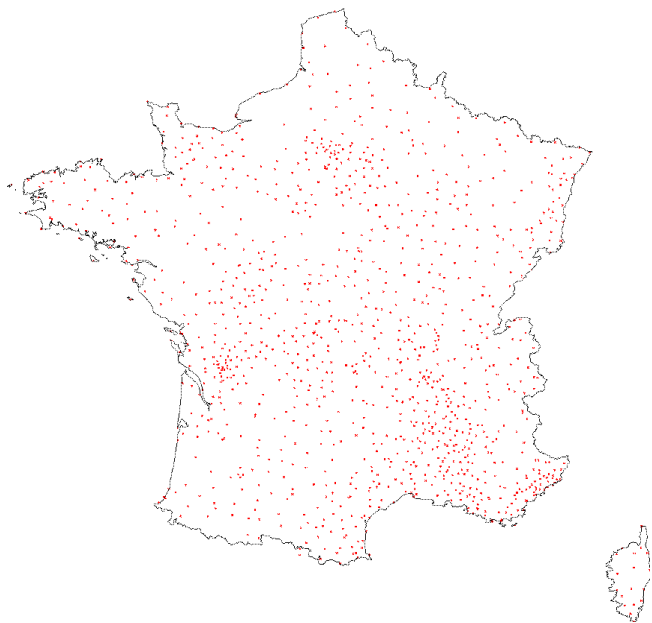
ALADIN forecast , from 06 to 30 h



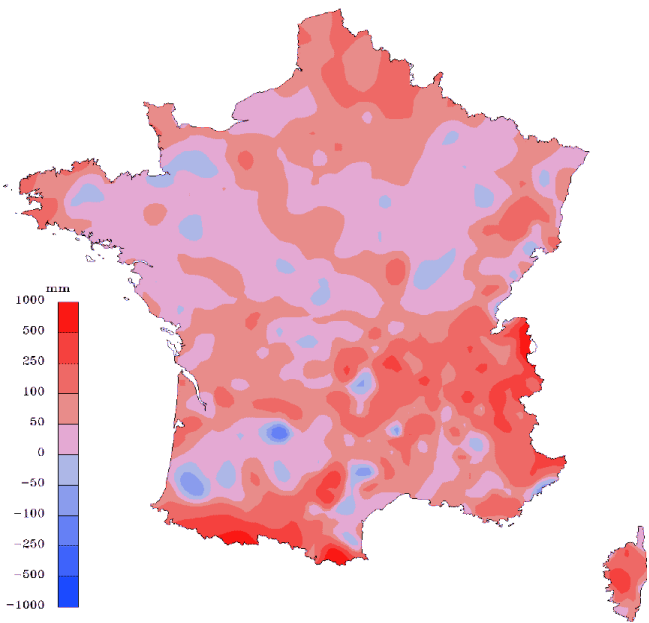
ARPEGE forecast, from 06 to 30 h



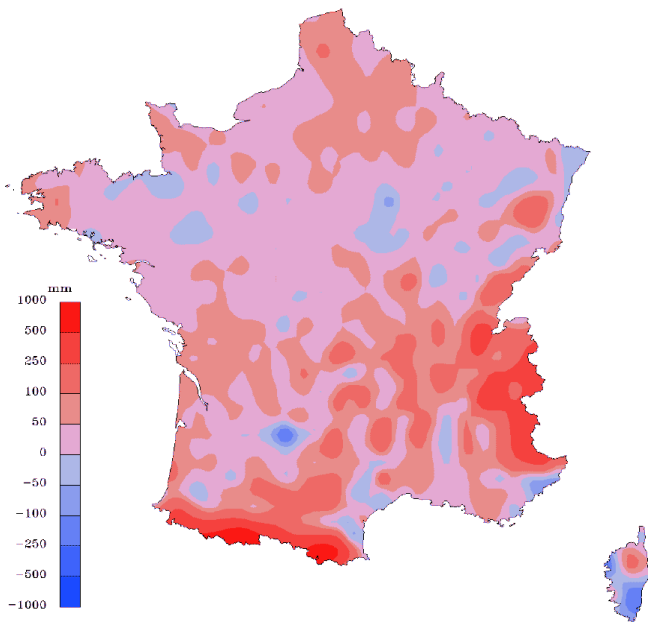
Observations density



ALADIN forecast - observations



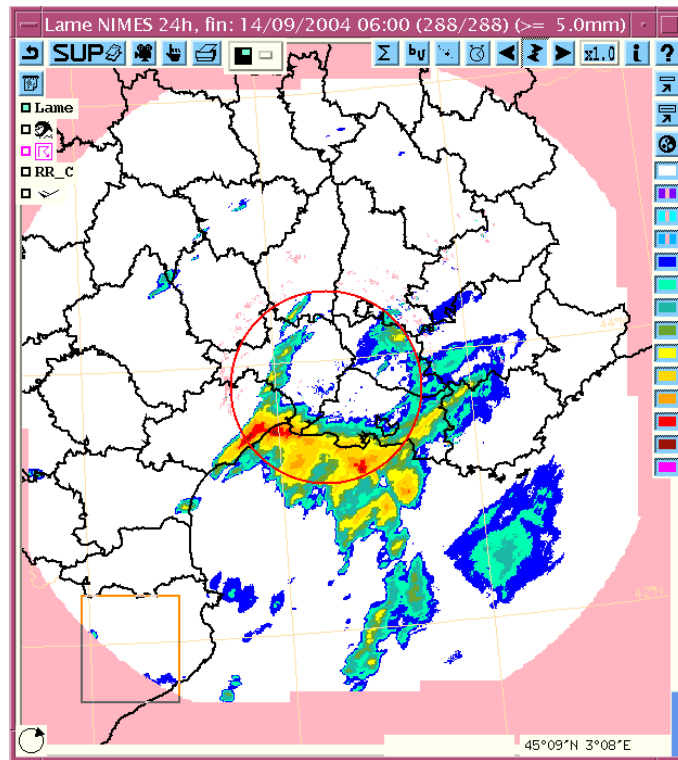
ARPEGE forecast - observations



But some very convincing ALADIN forecasts !

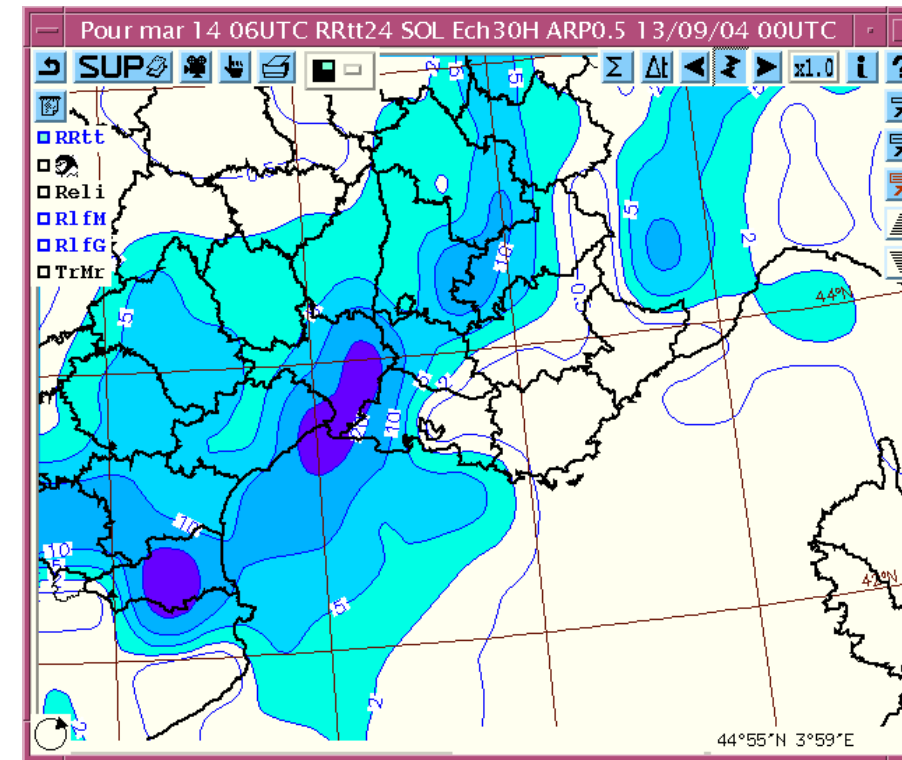
24-h cumulated rainfalls, from 2004/09/14 06 UTC till 2004/09/15 06 UTC

Radar observations

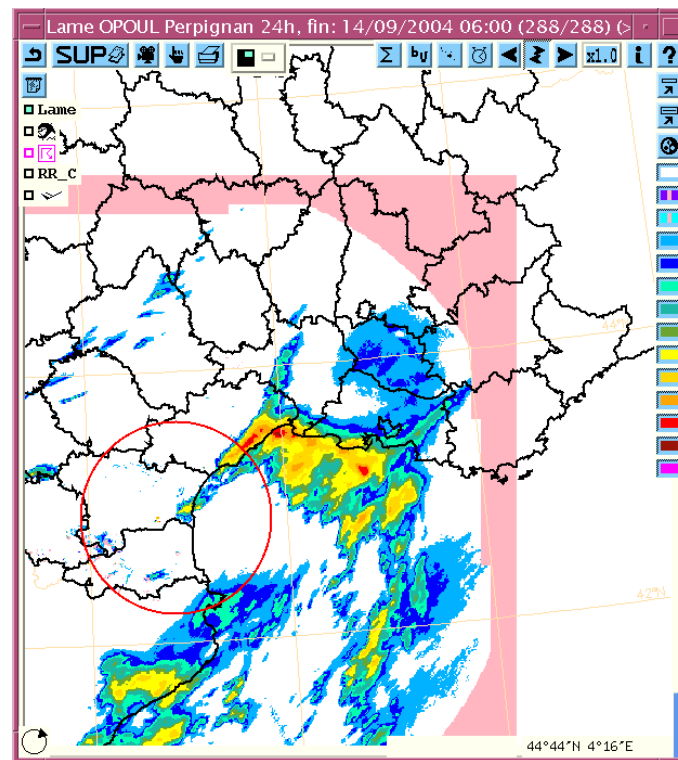


Nîmes

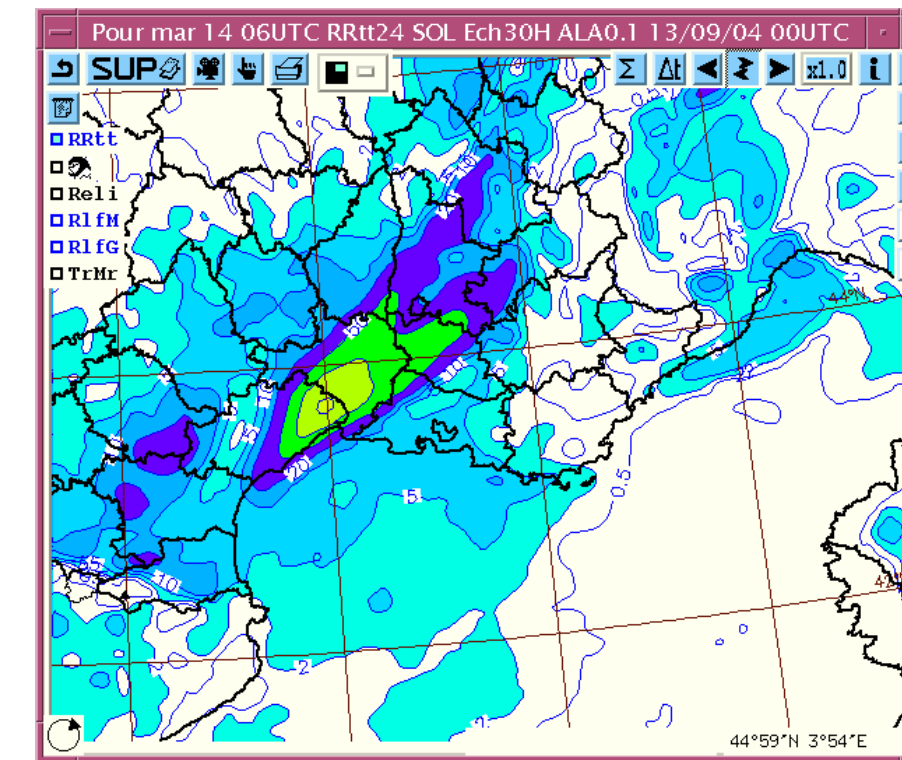
Model forecasts (54 h – 30 h)



ARPEGE



Opoul



ALADIN

More details : Joël Stein and Marc Tardy, DP/PREVI/COMPAS/COM (joel.stein@meteo.fr, marc.tardy@meteo.fr)