

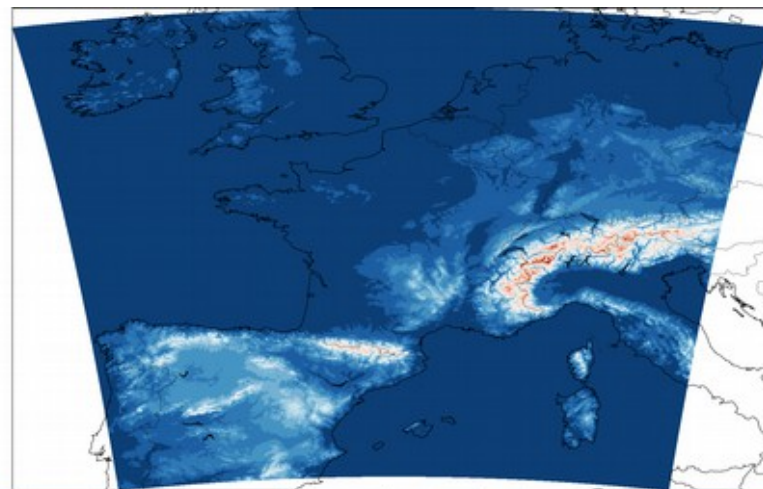
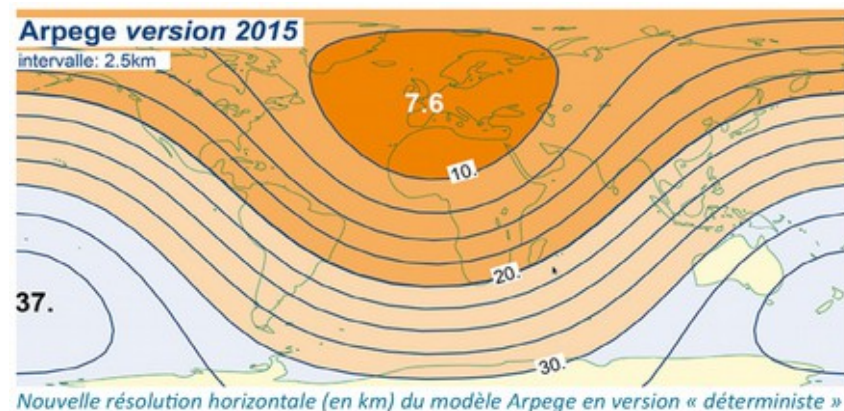


Subjective evaluation of NWP operational models at Météo-France

C. Maglione, B. Roulet, F. Bouysse
WGNE-31, 26-29 April 2016, Pretoria, South Africa

Arpege and Arome NWP systems

Systems	Characteristics (since 13 th April 2015)
ARPEGE <i>Deterministic</i>	TI1198c2.2 L105 (7.5km on W Europe) 4DVar (6h cycle): TI149c1L105 & TI399c1L105 5 forecasts per day up to 114h
AEARP <i>(global EDA based on ARPEGE)</i>	TI479c1 L105 ; 25 members 4D-Var (6h cycle): TI149c1 L105 Background covariances averaged on 1.5 days and updated every 6h
PEARP <i>(global EPS based on ARPEGE)</i>	TI798c2.4 L90 (10km on W Europe) 35 members ; twice a day up to 108h Using 17 EDA members and singular vectors New set of 10 physical packages (with new convection scheme "PCMT")
AROME-France <i>Deterministic</i>	1.3km (1536 x 1440 pts) L90: from 5m to 10hPa 3DVar (1h cycle) 5 forecasts per day up to 42h
AROME Overseas	2.5km L90 – Dynamical adaptation 4 forecasts per day up to 42h



Outline

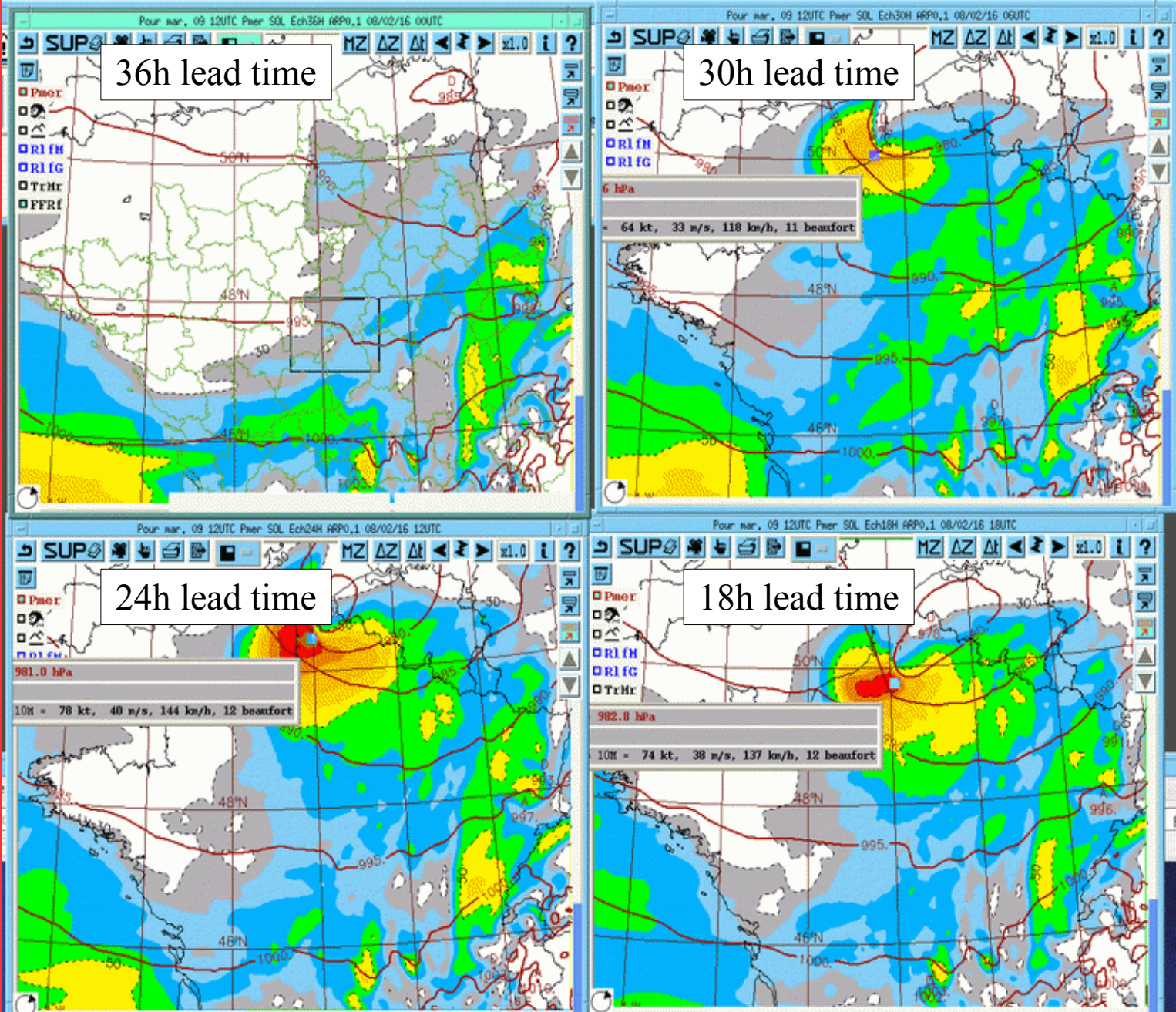
Typical issues :

- MSLP gradient simulated by Arpege
- Wind gusts
- Low level cloudiness
- Convective cells
- Variability between successive forecasts

MSLP gradient simulated by ARPEGE

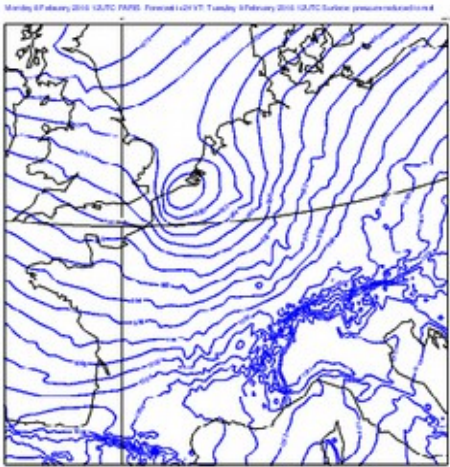
Arpege forecasts for 09/02/2016 at 12h UTC

MSLP+Wind gusts

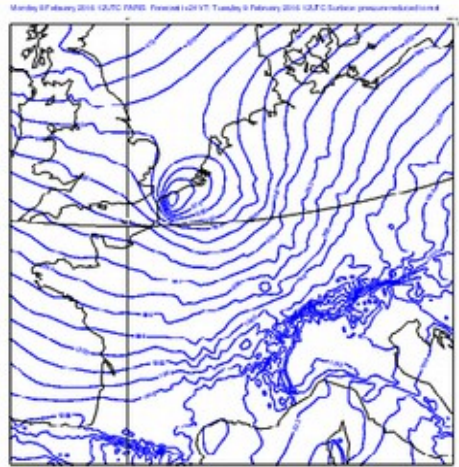


24h forecasts

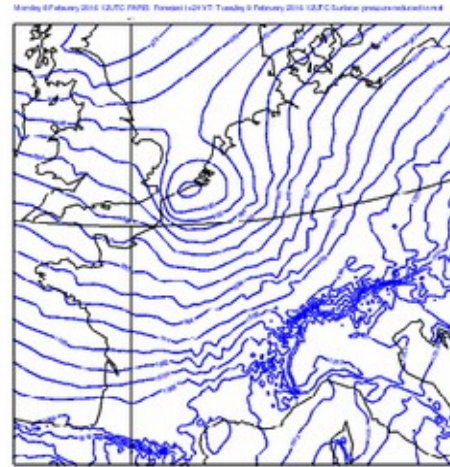
ARP
« antiarp v1 »



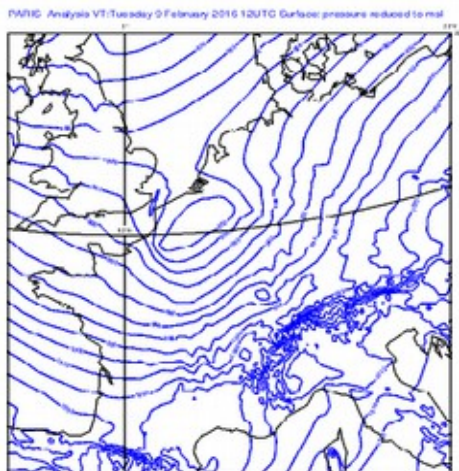
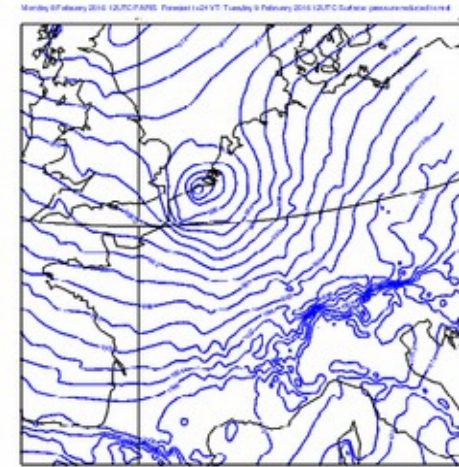
ARP oper



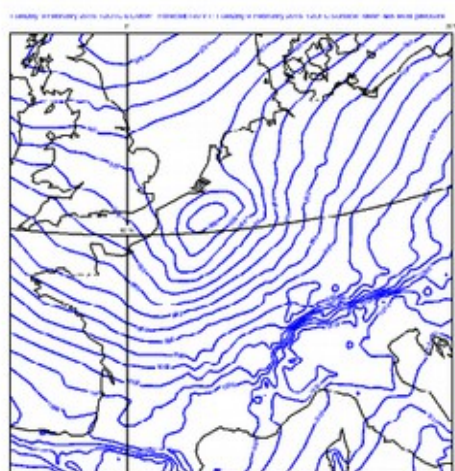
ARP
« antiarp v3 »



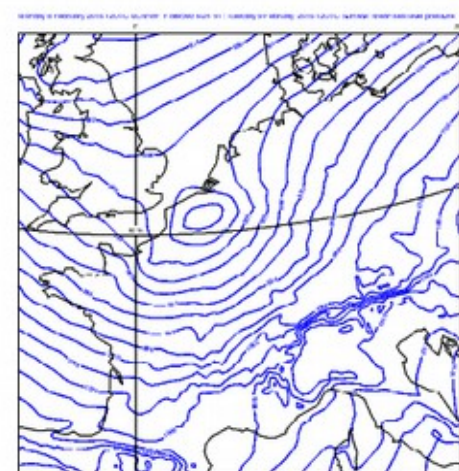
ARP with PCMT



Analyse ARP oper



Analyse IFS oper

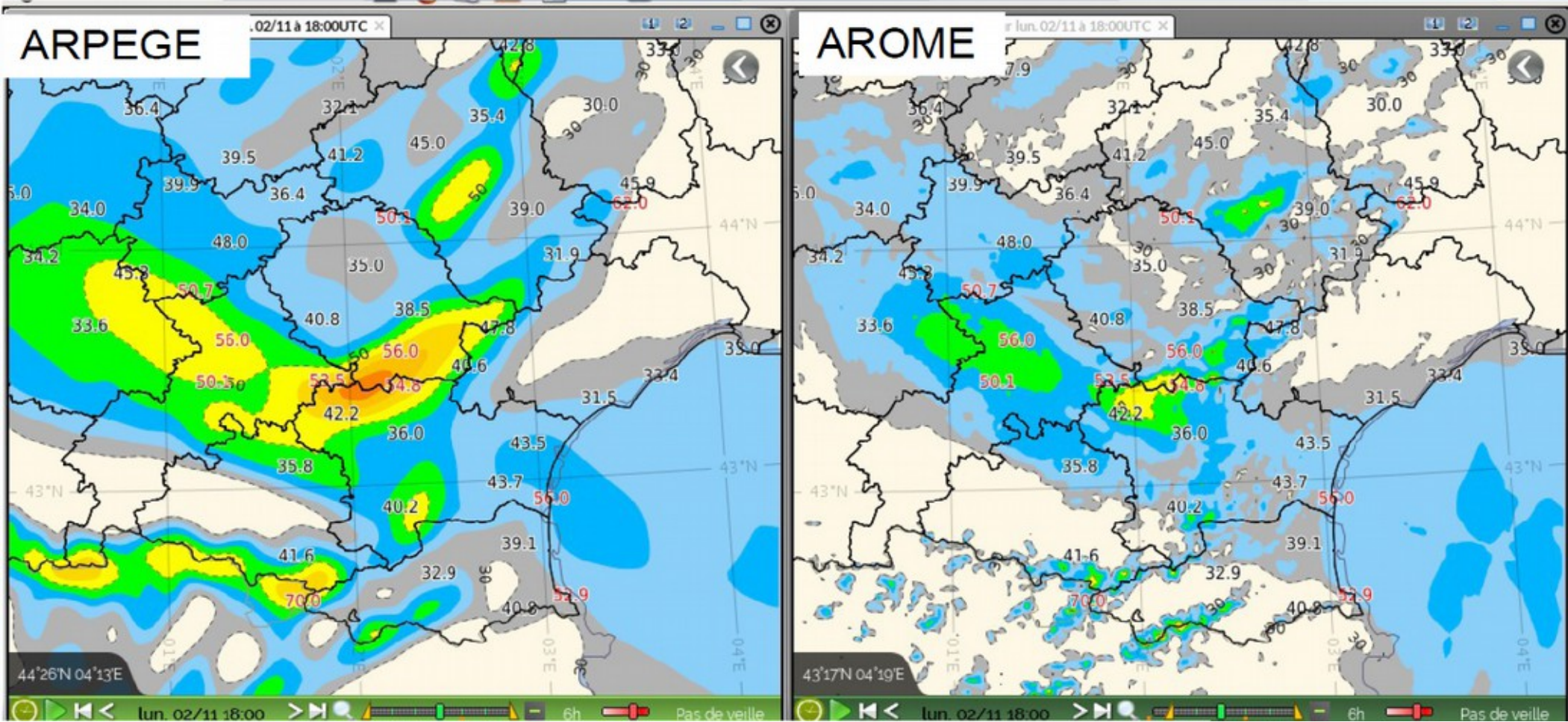


IFS oper

Wind gusts

« Autan » regional wind – 02/11/2015

18h forecast of 10m maximal wind gusts (over 1h) for 02/11/2015 at 18h UTC



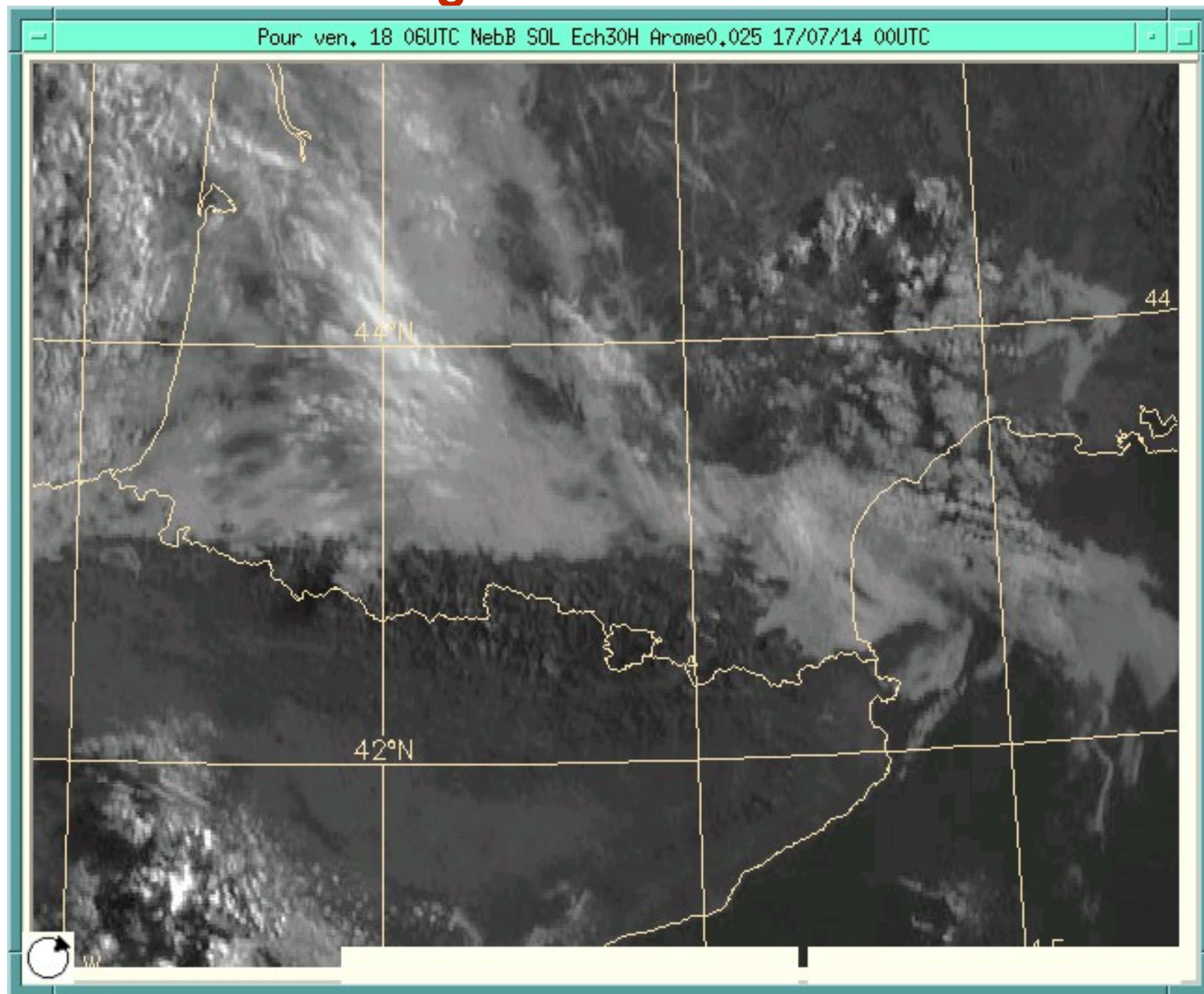
>50kt

>40kt

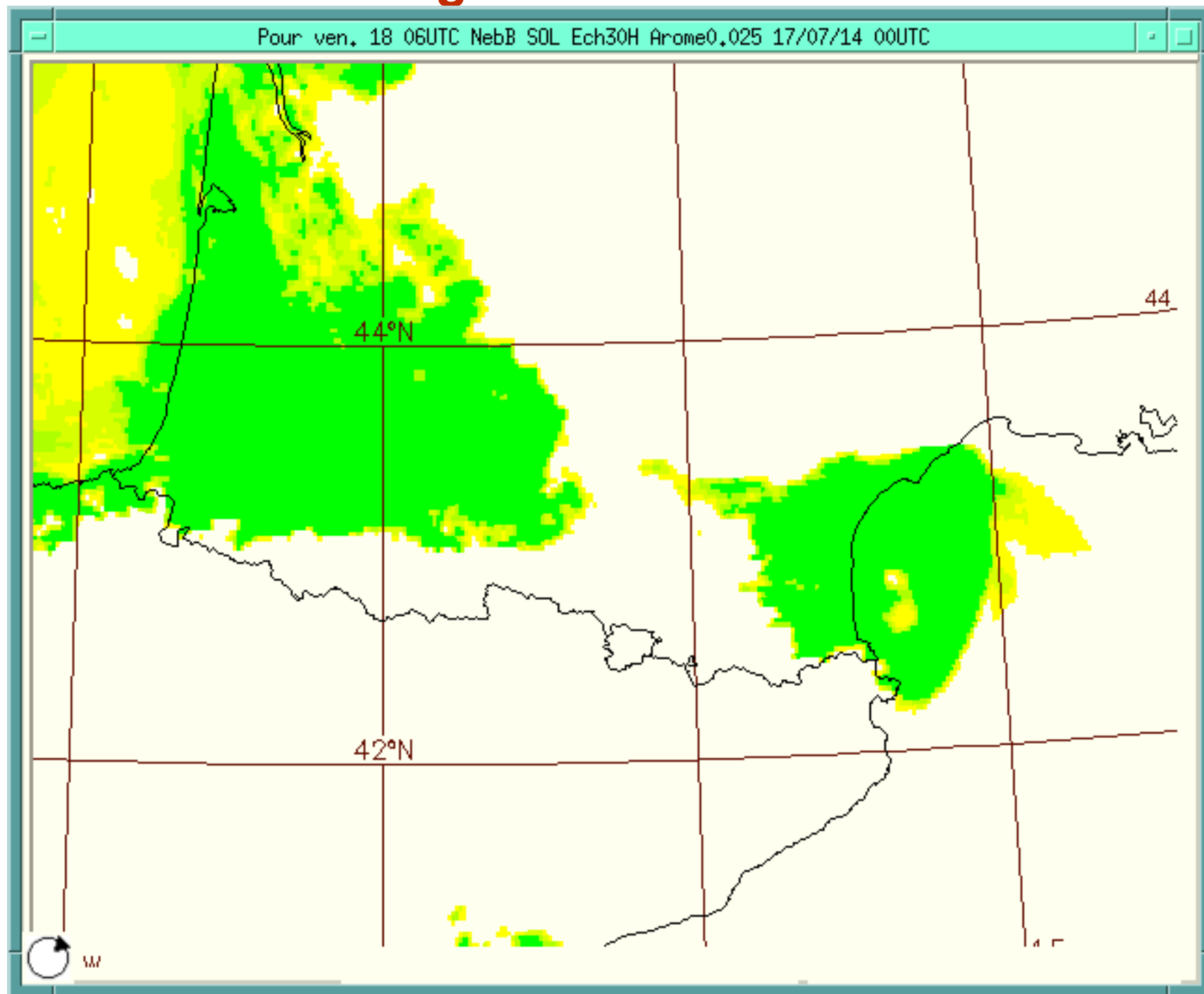
>30kt

Low level cloudiness

Fog and low clouds

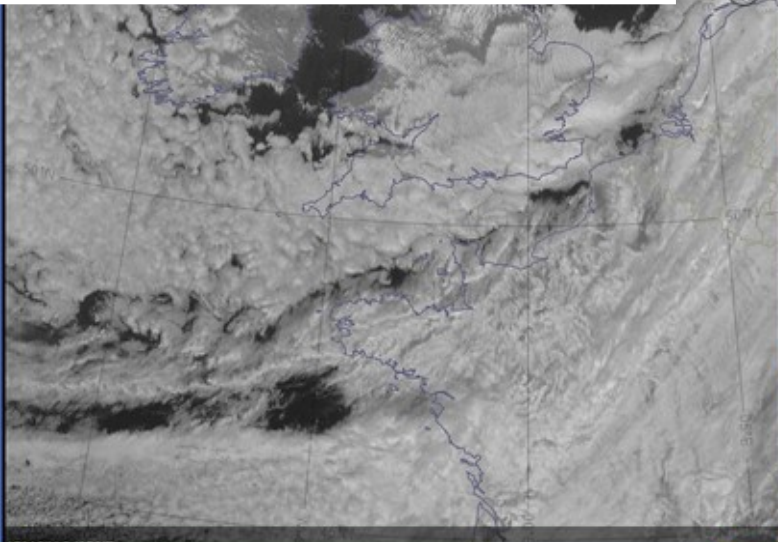


Fog and low clouds

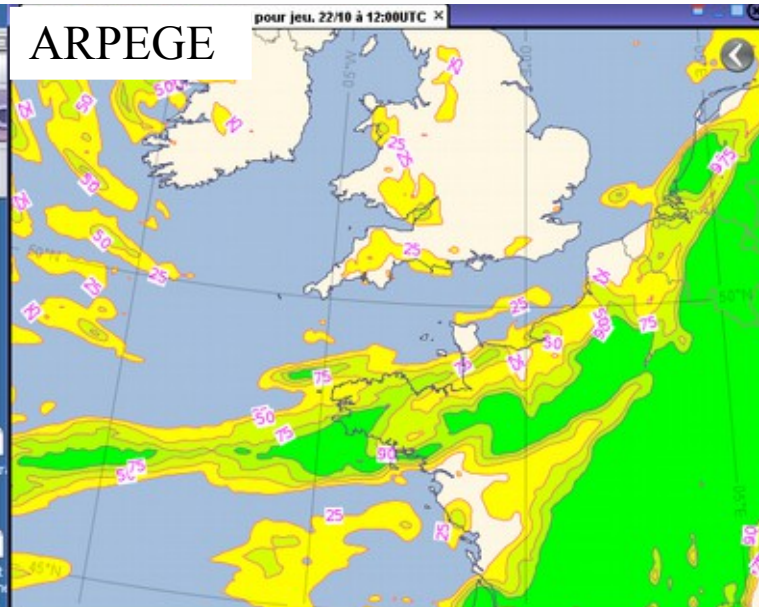


Low cloudiness 22/10/2015

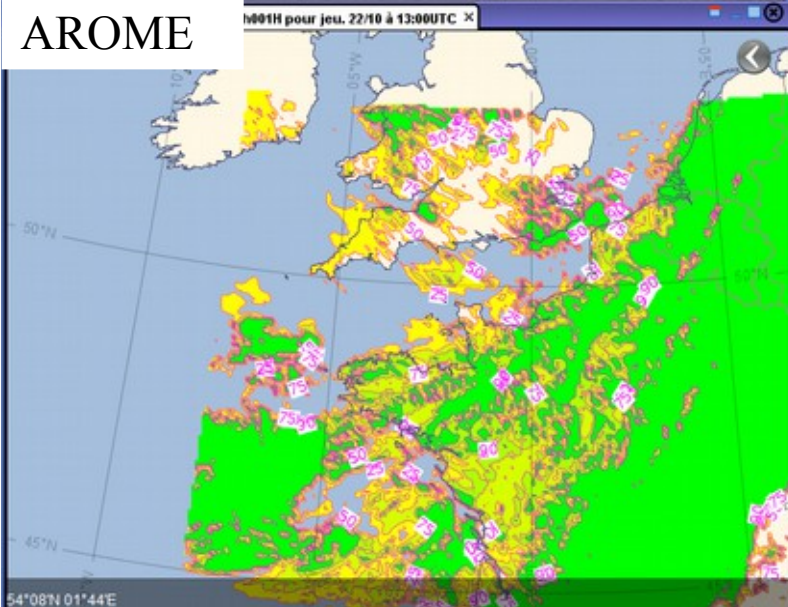
Obs Visible HR 22/10 à 11h45TU



ARPEGE



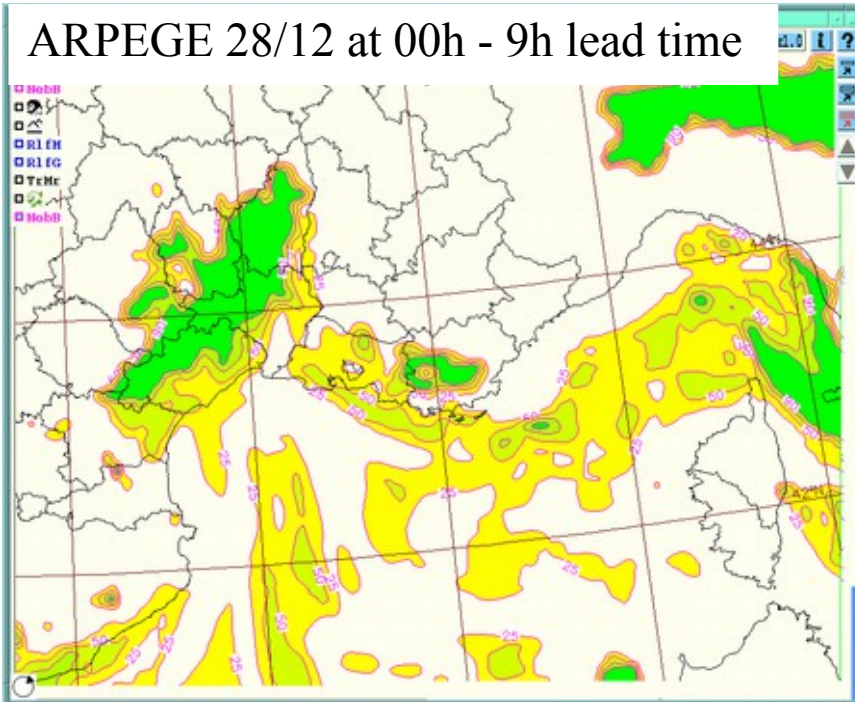
AROME



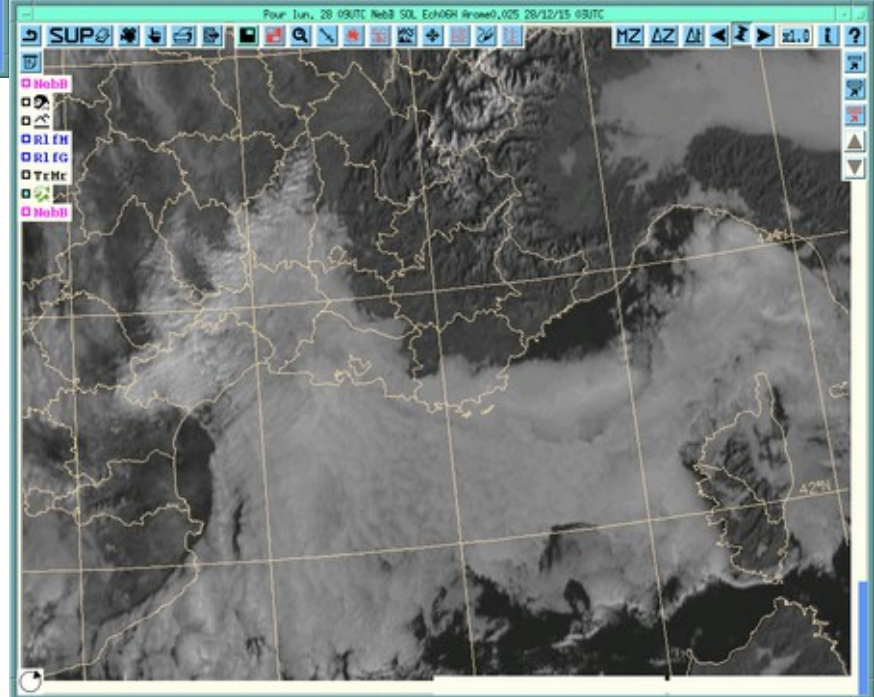
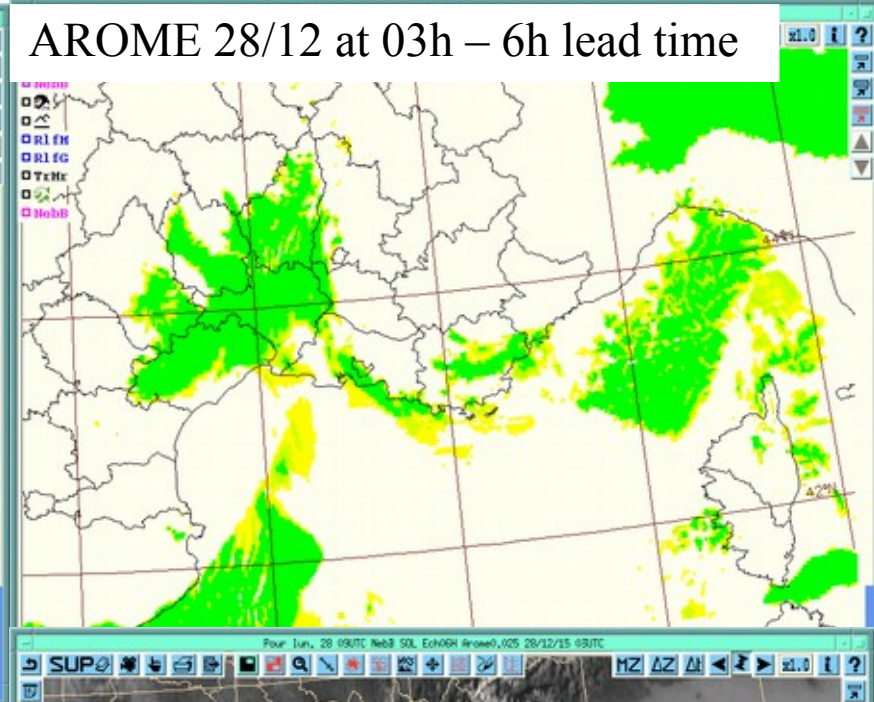
- Underestimation of low level clouds forecasted by AROME and ARPEGE models at very short range

Low cloudiness 28/12/2015

ARPEGE 28/12 at 00h - 9h lead time



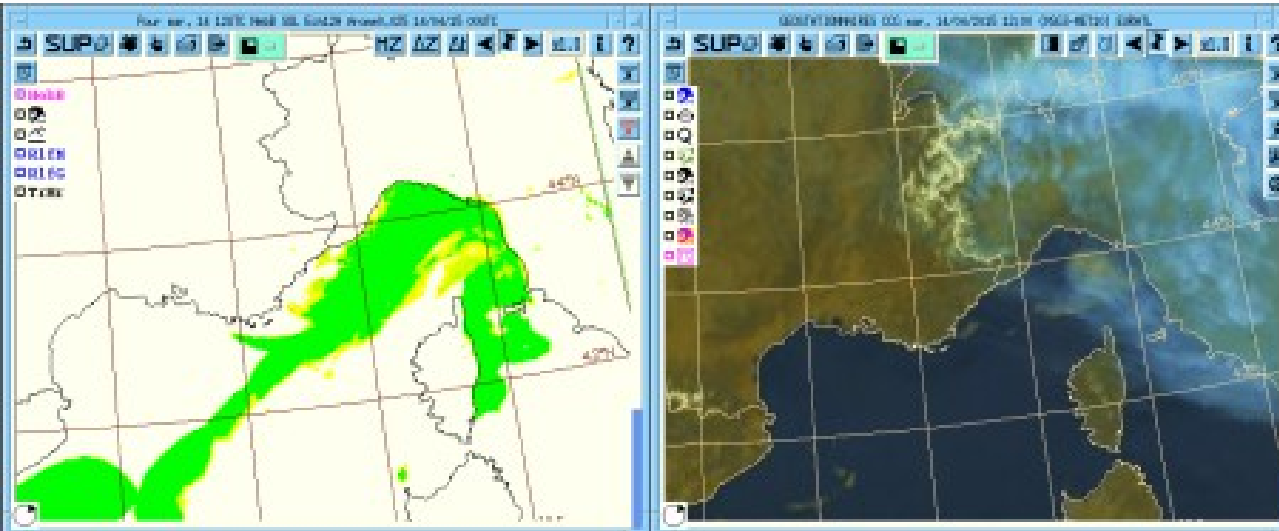
AROME 28/12 at 03h - 6h lead time



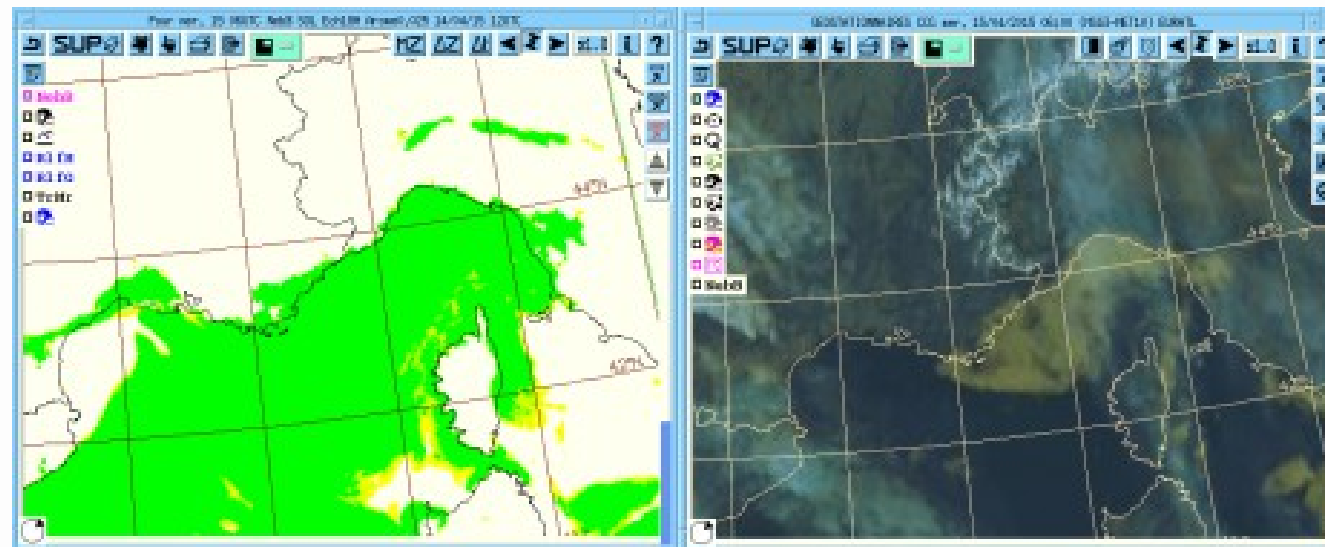
- Underestimation of low level clouds over West Mediterranean forecasted by AROME and ARPEGE at very short range

Low cloudiness 14/04/2015

Modèle AROME du 14/04/2015 à 00h ech21



Modèle AROME du 14/04/2015 à 12h ech81

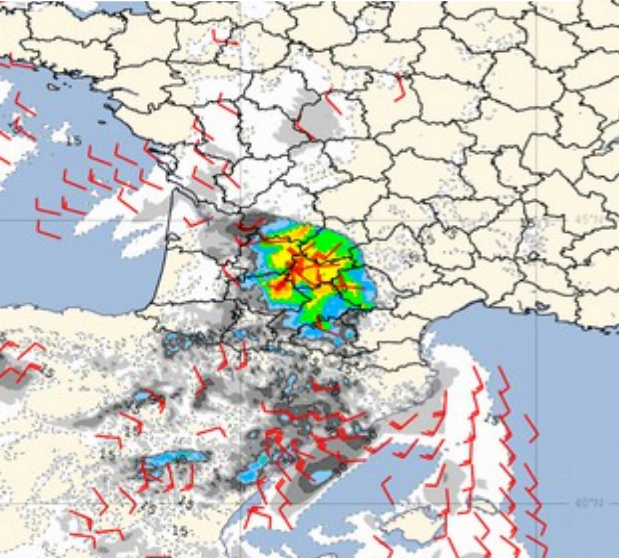


- BUT sometimes also overestimation of low level cloudiness by models

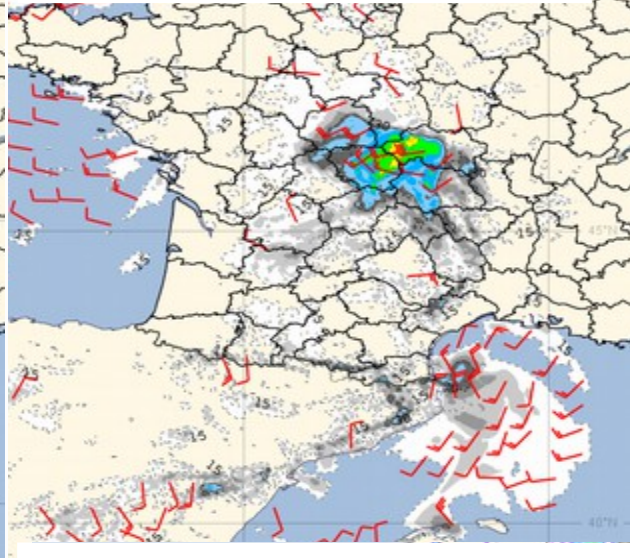
Convective cells

3/08/2015 : Thunderstorms

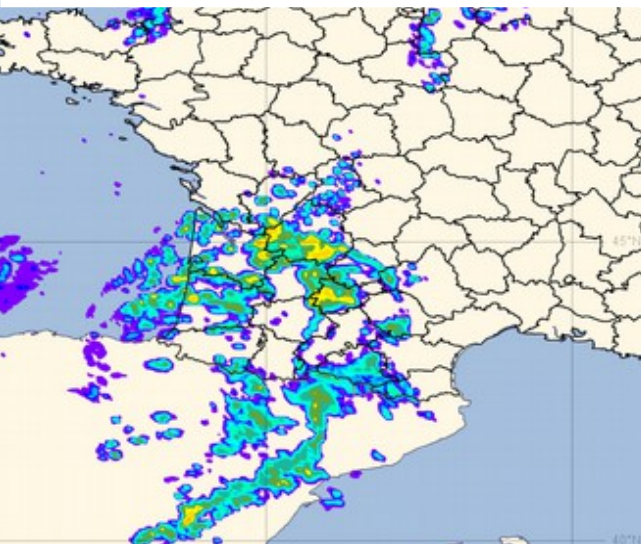
Wind Ech 33 – 3/08 à 21hTU



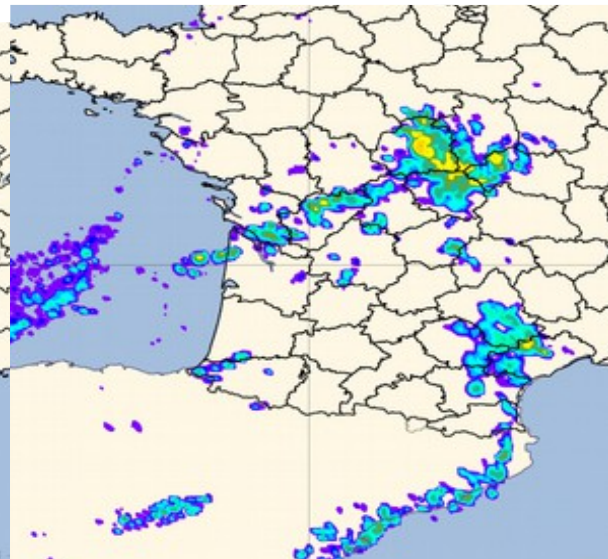
Wind Ech 36 – 4/08 à 0hTU



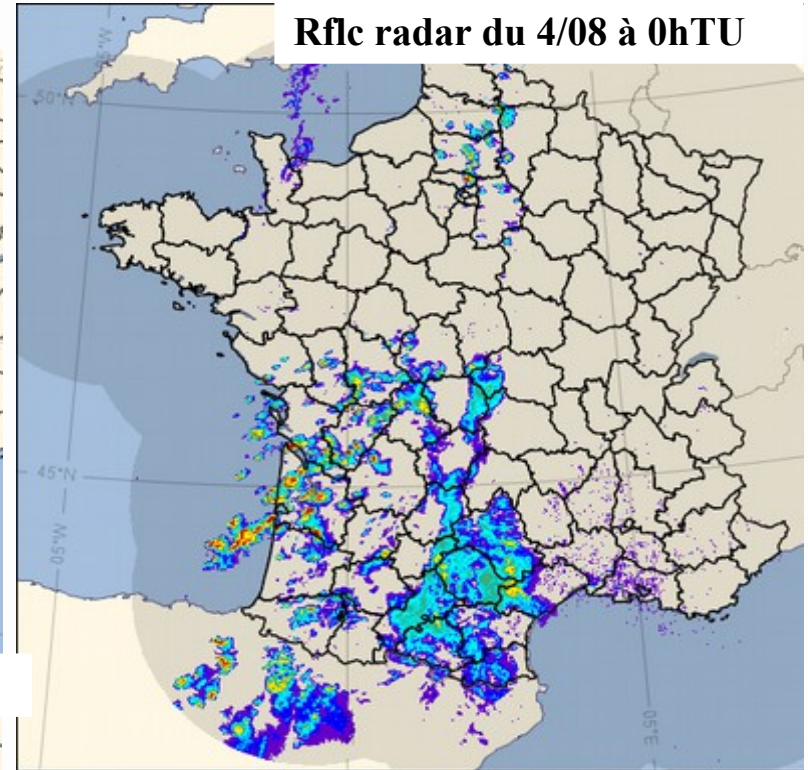
Rflc max Ech 33 – 3/08 à 21hTU



Rflc max Ech 36 – 4/08 à 0hTU



Rflc radar du 4/08 à 0hTU



Wind/Gusts/Reflectivities max AROME pour le 3/08
Forecast from 02/08/2015 à 12h

31/08/2015 : Thunderstorms

AROME : RlfcMax et DiagGrele

AROME : FFRaf 1h

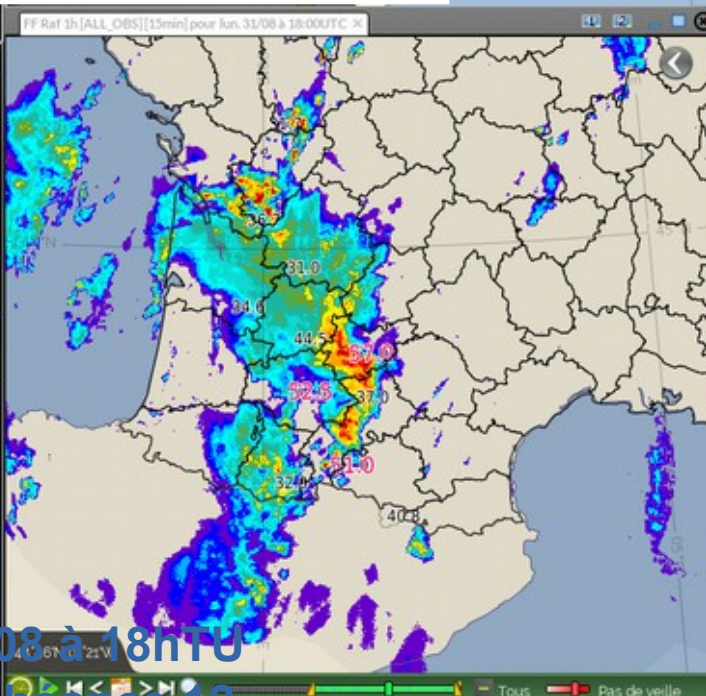
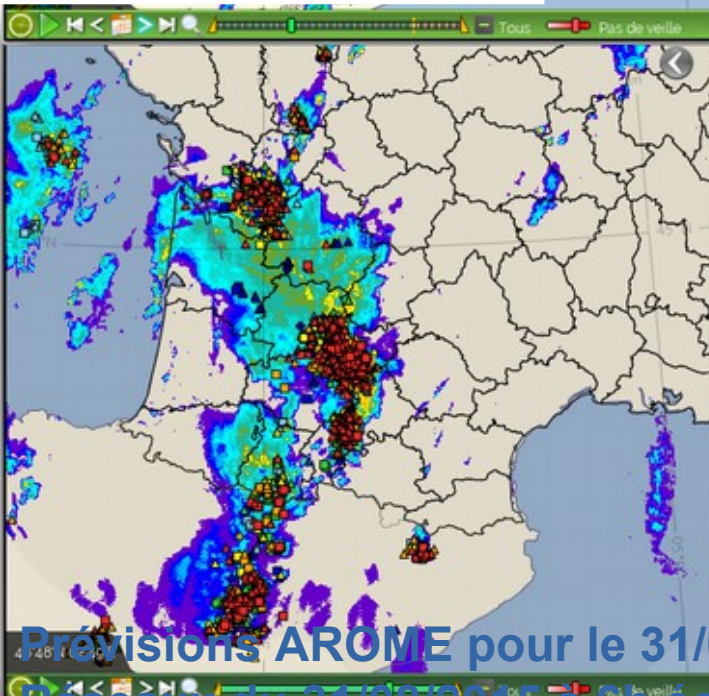
AROME : RR 1h



RlfcRadar + Impacts Foudre

RlfcRadar + Rafales 1H

Lame d'eau 1h Antilope

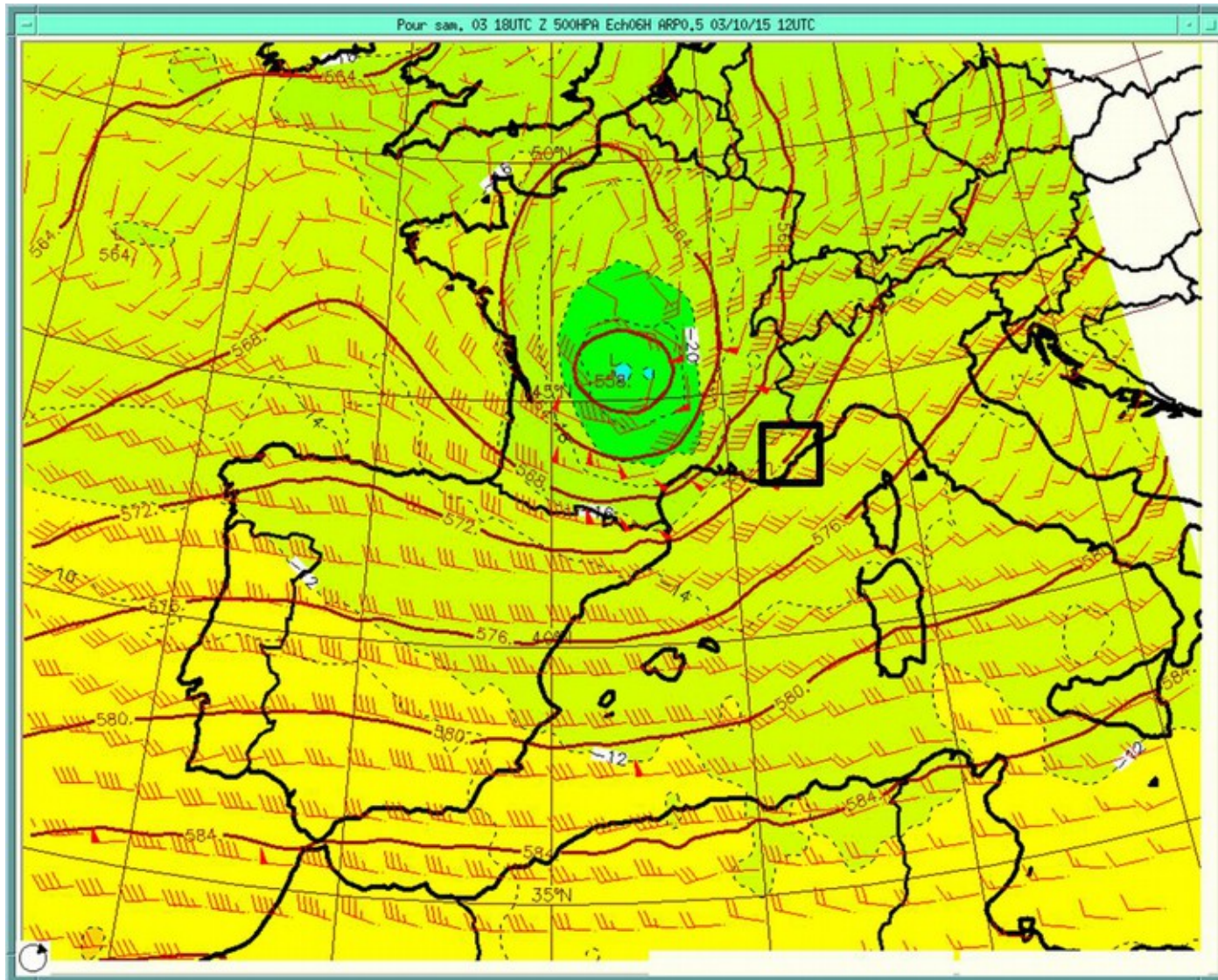


Prévisions AROME pour le 31/08 à 18h TU

Reseaux du 31/08/2015 à 6h echeance 12

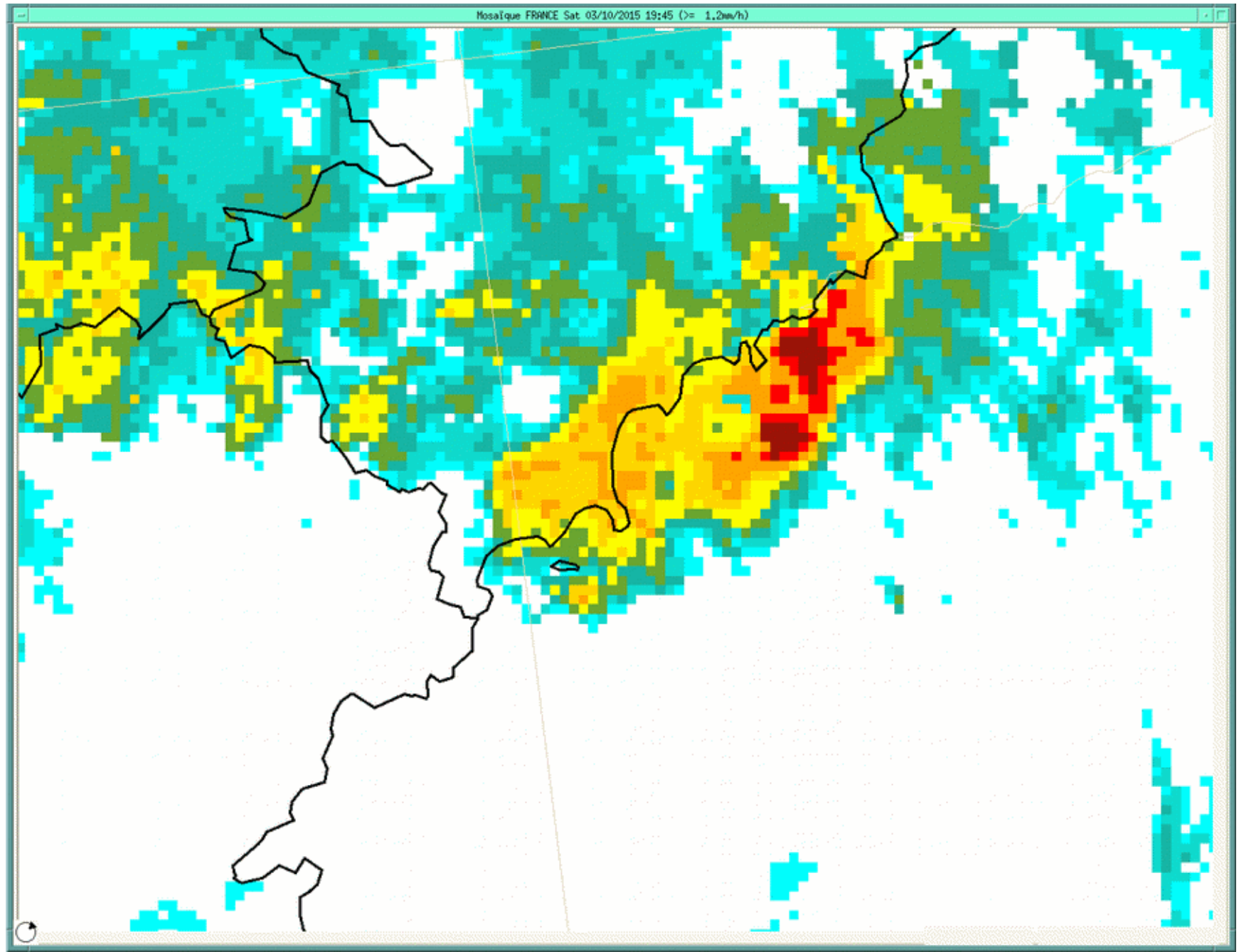
Variability between successive AROME forecasts

High mediterranean precipitation event : 3 octobre 2015

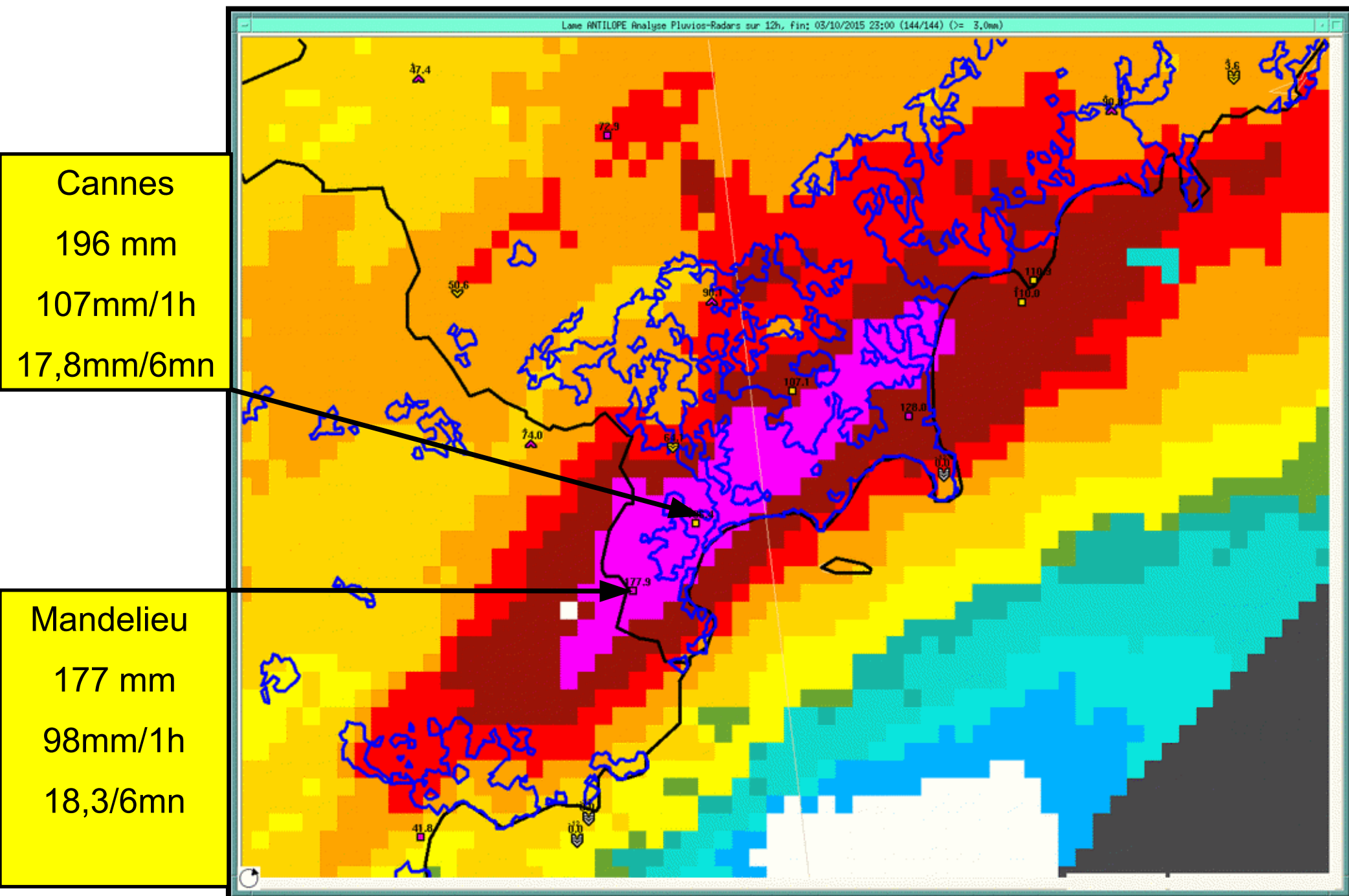


Z, T vents à 500 hPa

Radar animation from 18h to 19h45 UTC

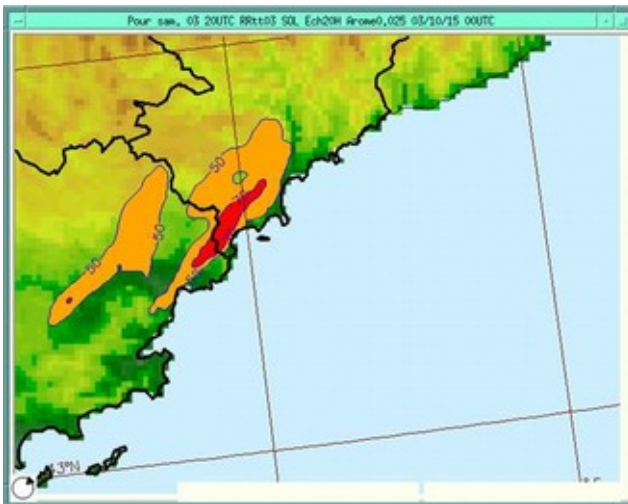


Precipitation analysis

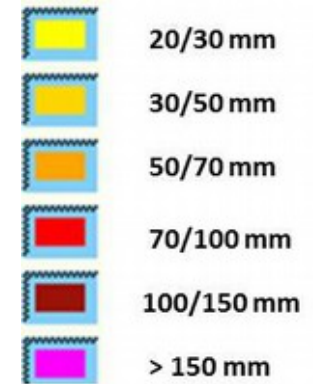
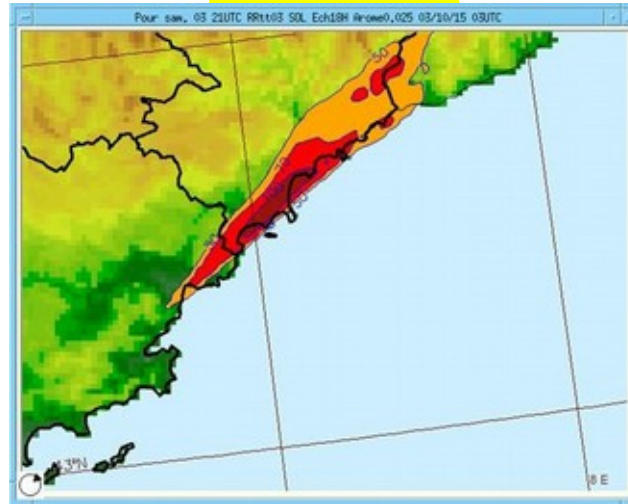


3h cumulated precipitation forecasted by Arome

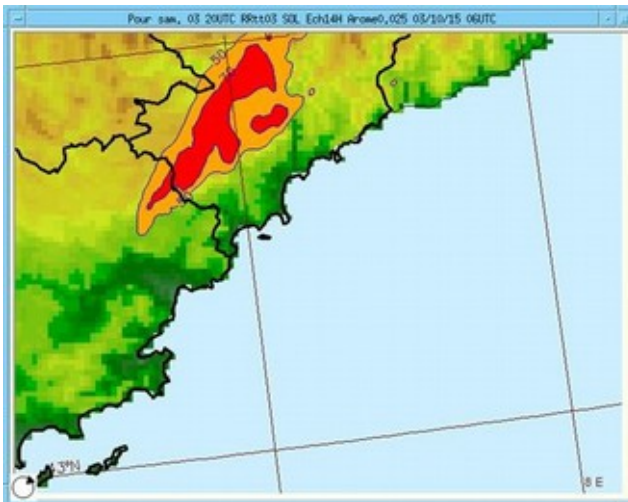
ARO 00



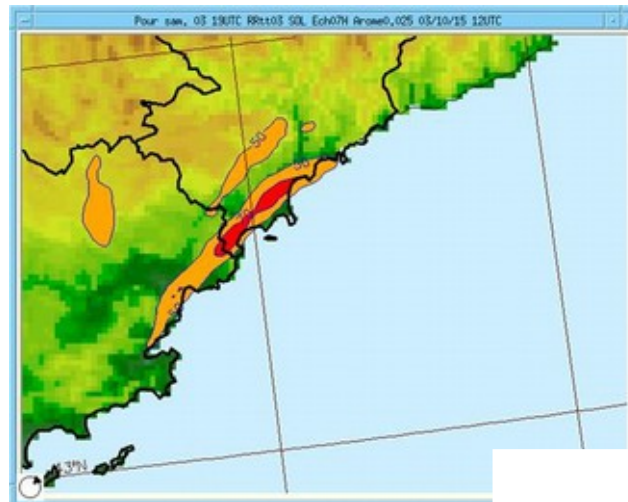
ARO 03



ARO 06



ARO 12



ANTILOPE 3H



Conclusions

Very positive balance sheet of kilometric scale AROME use by forecasters

Advantages of AROME versus global model ARPEGE :

- see breeze, precipitation features, fog and low clouds, etc...**
- orography: precipitations and winds**
- resolution of strong convection**

Some problems of false alert with AROME (but less with new operational version at 1.3km) :

- gust and thunderstorm**
- heavy rainfall**

Next challenge for forecasters: work with the AROME EPS (to be operational by end of 2016)