

Météorologie dynamique

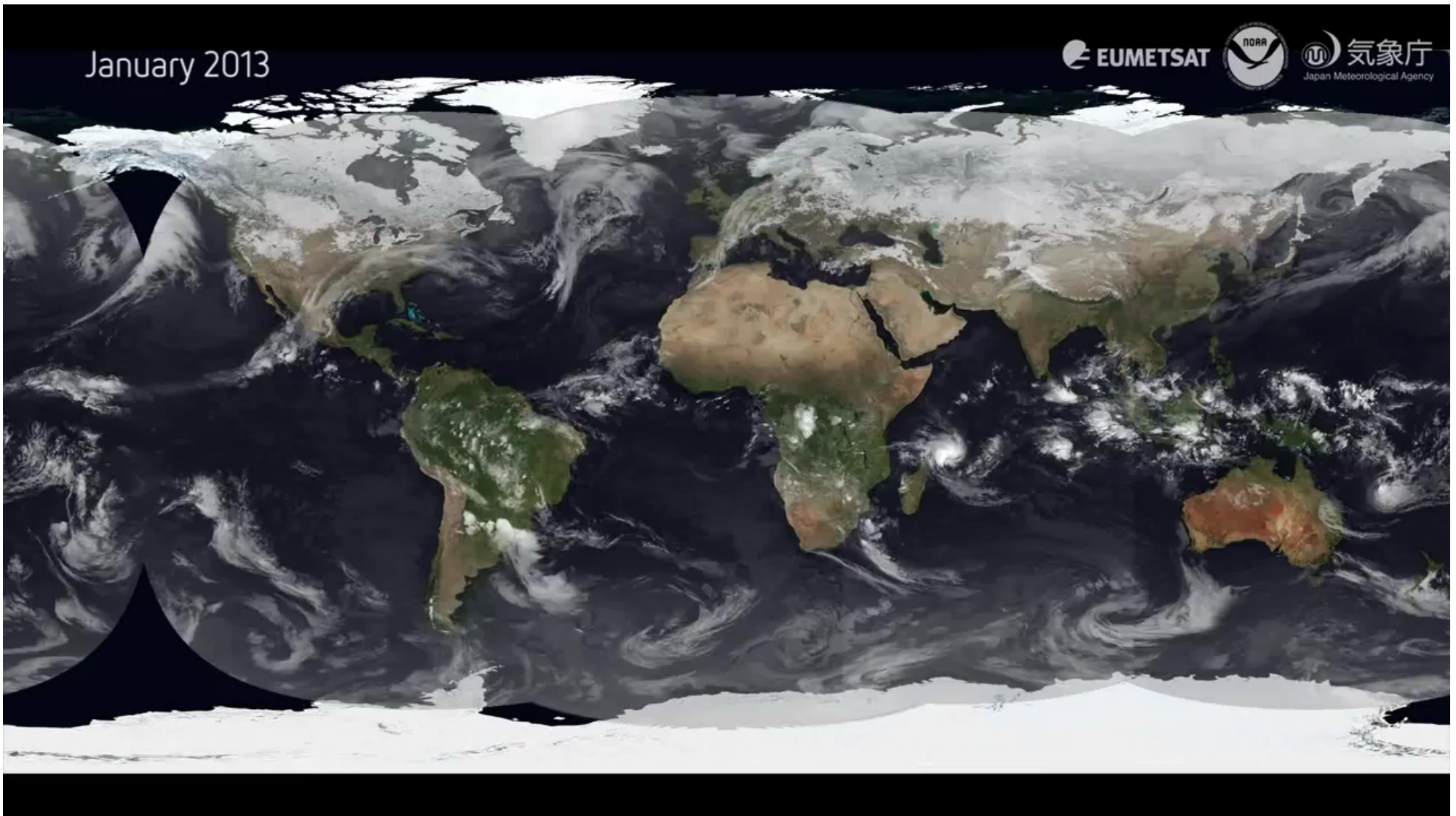
Caroline Muller

carolinemuller123@gmail.com



Référence: « An introduction to dynamic meteorology » de Holton

January 2013

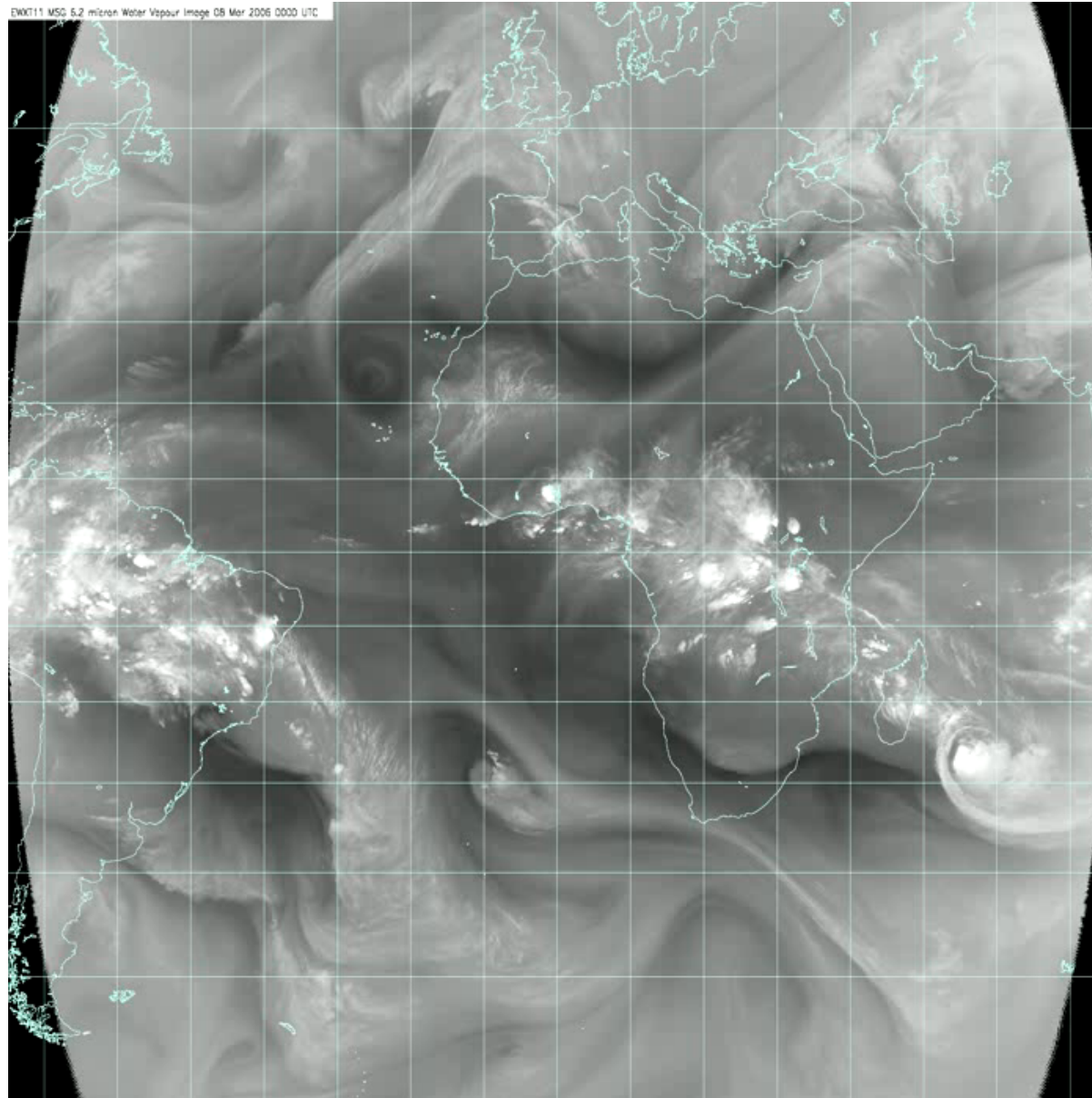


A Year of Weather 2013

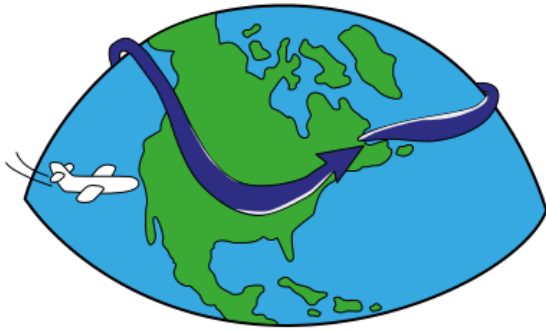
This visualisation, comprised of imagery from the geostationary satellites of EUMETSAT, NOAA and the JMA, shows an entire year of weather across the globe during 2013, with audio commentary from Mark Higgins, Training Officer at EUMETSAT.

The satellite data layer is superimposed over NASA's 'Blue Marble Next Generation' ground maps, which change with the seasons.

atmospheric water vapor (white=humid)



6.2_micron_wv_700-300-meteosat



courant-jet polaire



The ocean is very effective at storing heat...

	Heat capacity	Density
Air (300°K, dry)	1005 $J/(kg \text{ } ^\circ K)$	1.18 kg/m^3
Water (20°C, 30 PSS)	3993 $J/(kg \text{ } ^\circ K)$	1021 kg/m^3

The ocean strongly moderates the seasonal cycle in surface temperature:

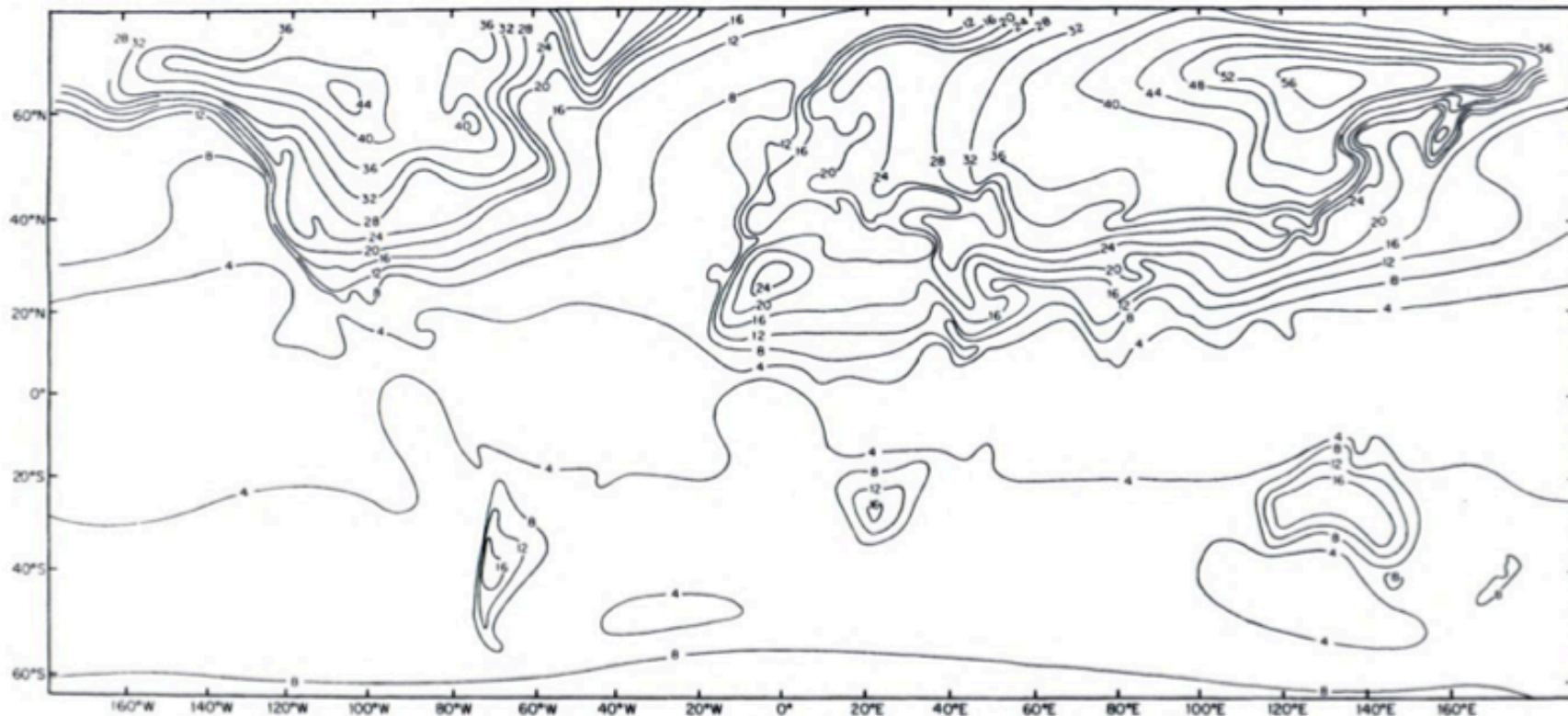
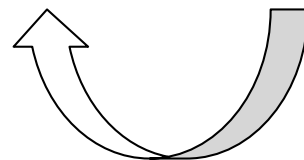
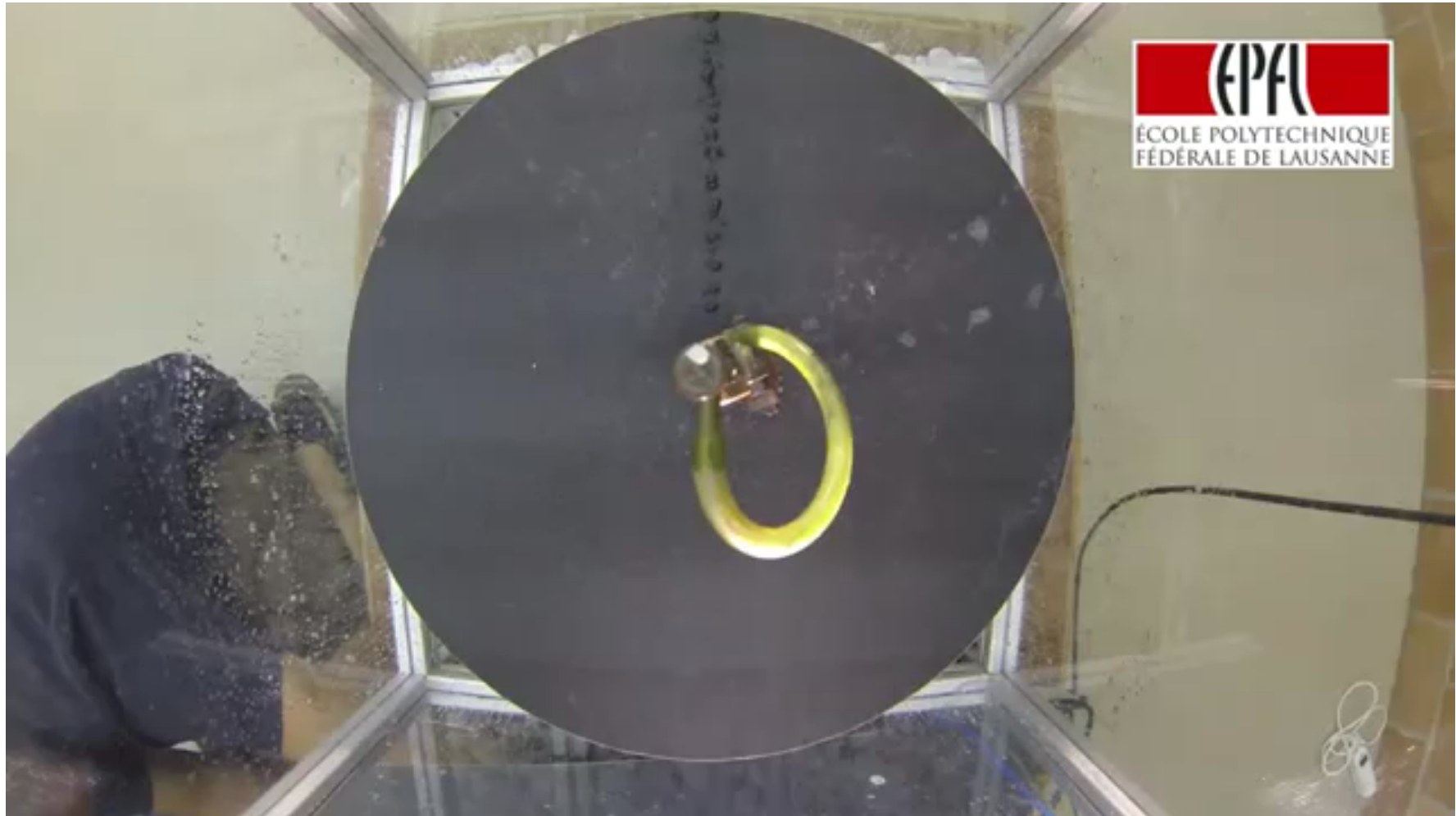


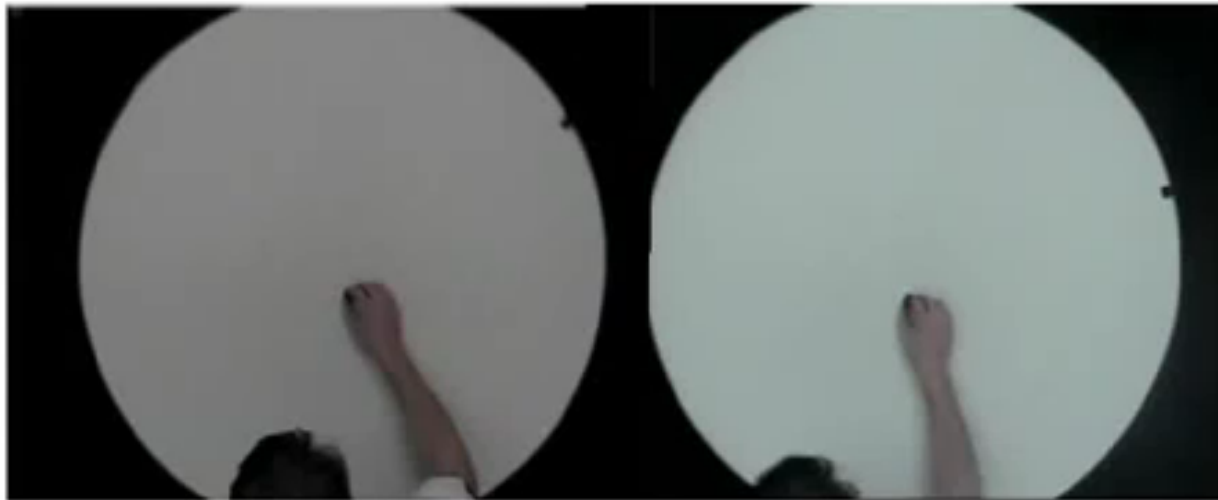
Fig. 2.1. Annual range of monthly mean temperatures at the earth's surface. [Adapted from Monin (1975, p. 203).]

Coriolis effect



Expériences EPFL

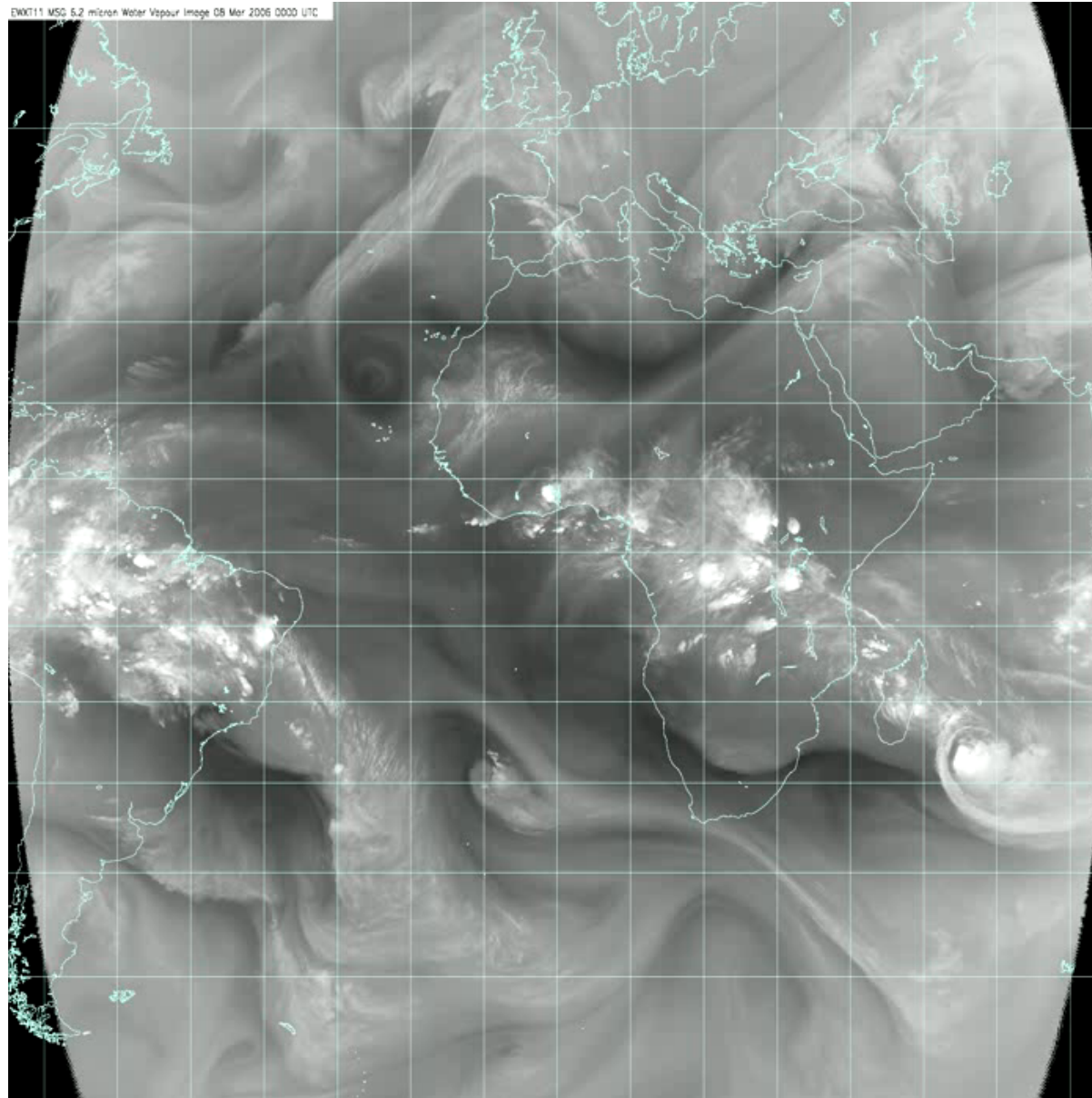
Oscillations inertielles



ocw.mit.edu

Trajectory on the parabolic turntable, both in the rotating and laboratory frames. Notice that when the puck moves in the rotating frame it is deflected to the right.

atmospheric water vapor (white=humid)



6.2_micron_wv_700-300-meteosat

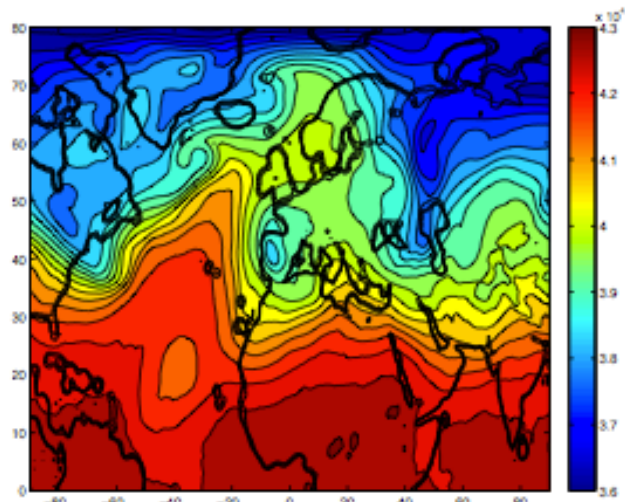


Figure 1 : $\Phi_{500} - \Phi_{850}$ le 7 janvier 2009.

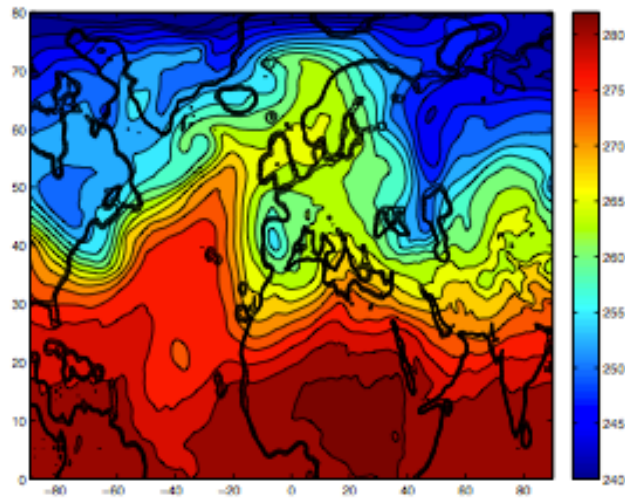


Figure 2: température moyennée entre 500 et 850hPa le 7 janvier 2009.

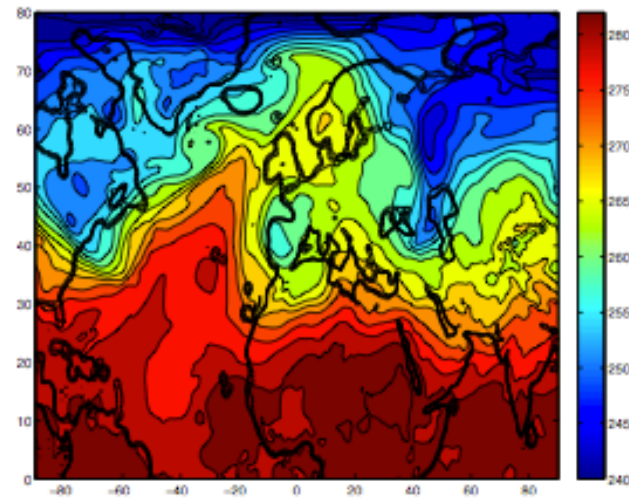


Figure 3: température à 700hPa le même jour.

L'épaisseur entre 2 isobares est similaire à la température dans cette couche

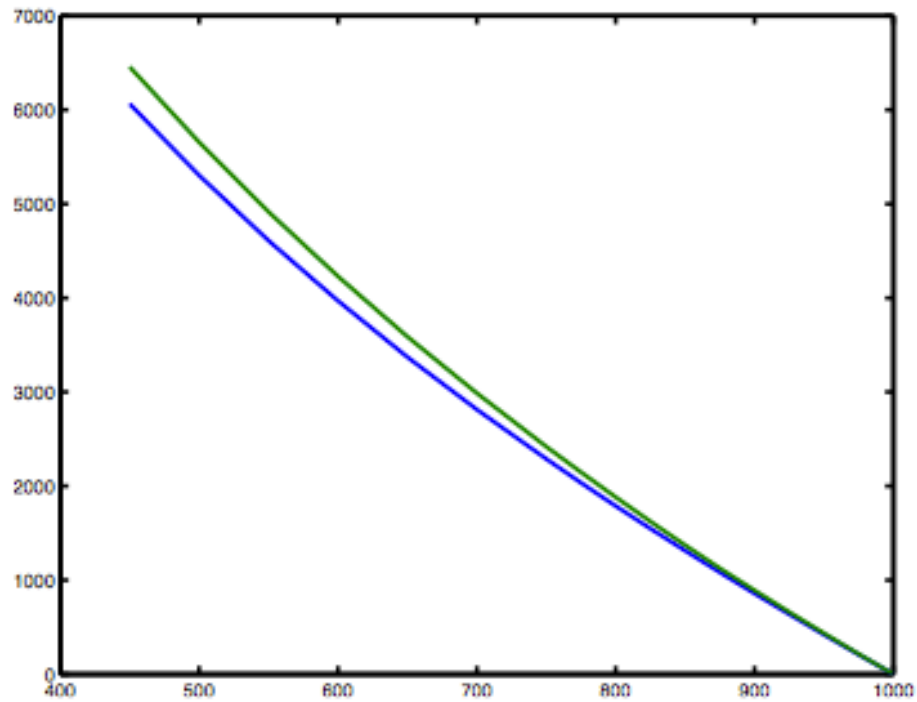
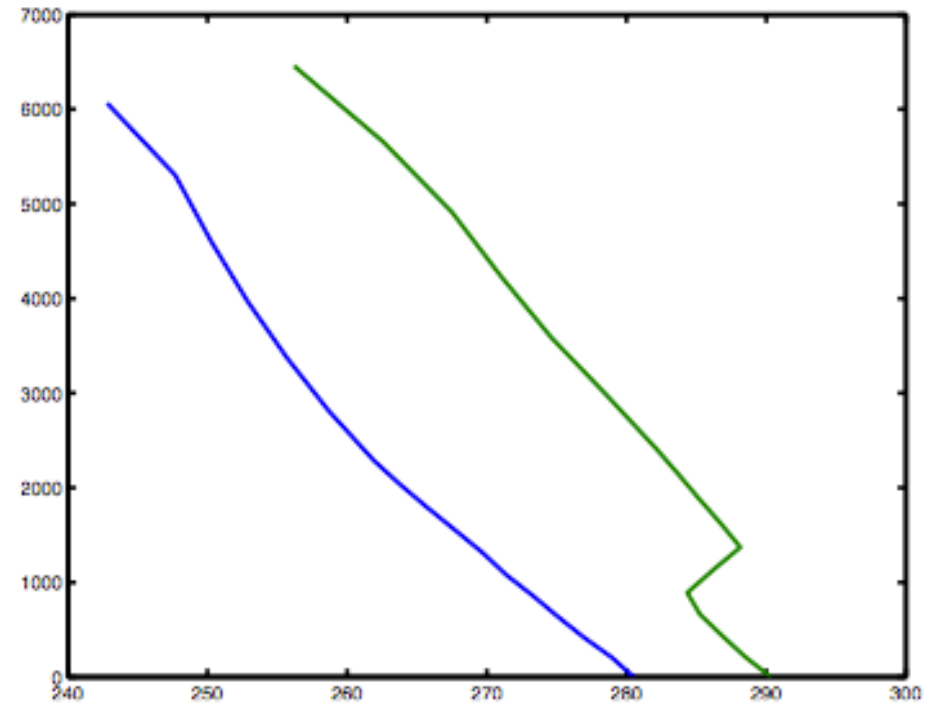


Figure 6a: pression en fonction de z pour la situation de la figure 1 (avec $p_0 = 1000hPa$).



(b): température en fonction de z .

p et T décroissent avec l'altitude
 Décroissance plus lente aux chaudes T

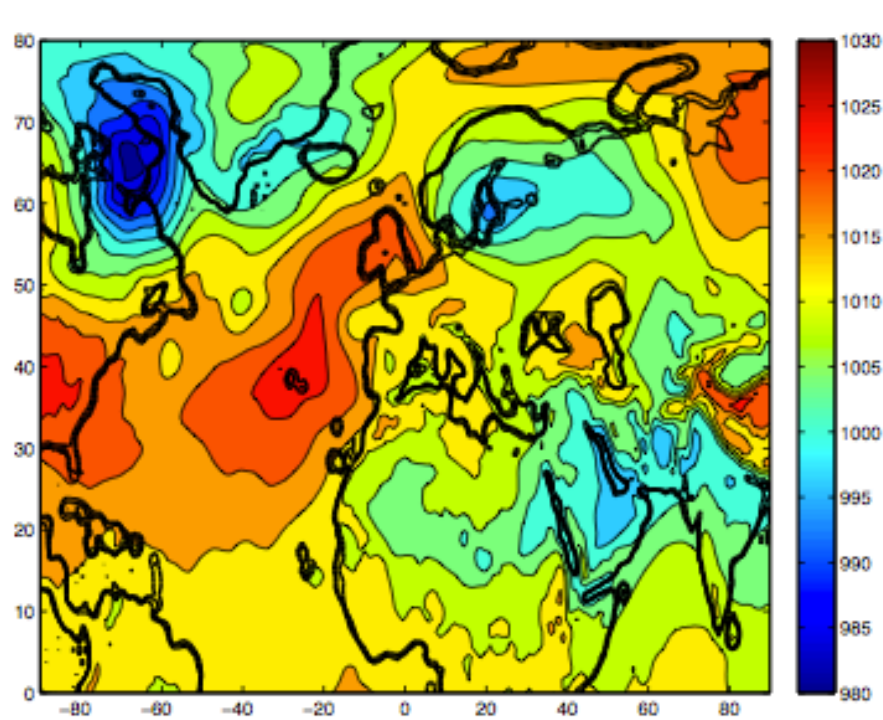


Figure 7 : pression au niveau de la mer, le 14 août 2003.

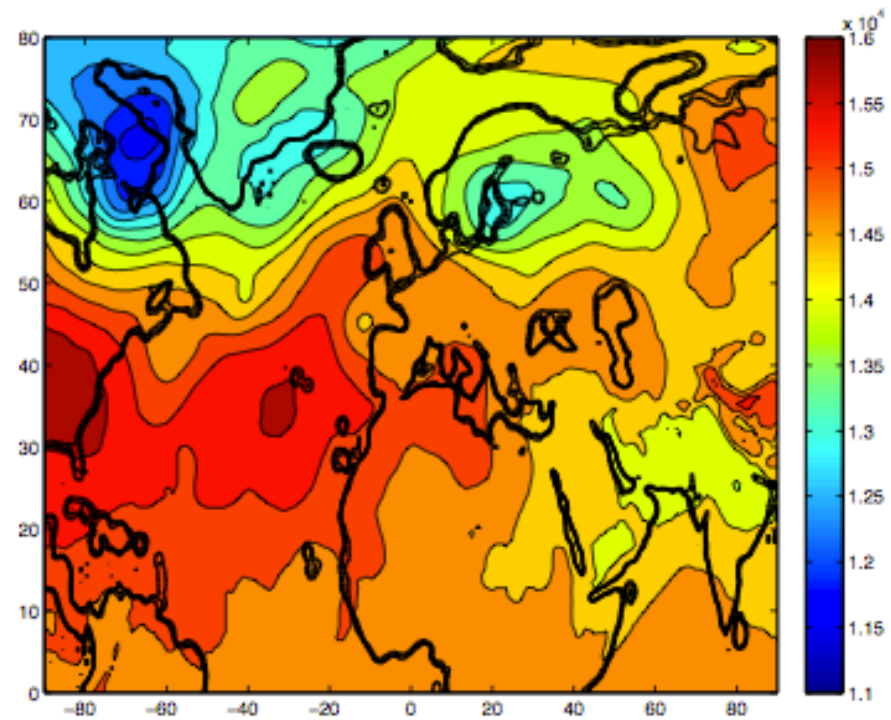
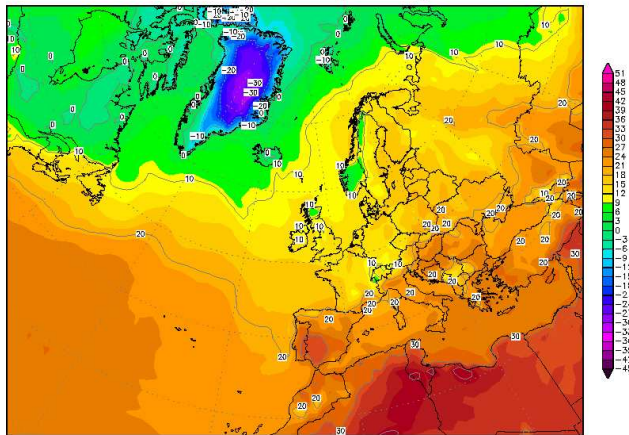


Figure 8 : géopotentiel à 850hpa le même jour.

Faible valeur de géopotiel \Leftrightarrow faible pression à altitude constante

Cartes sur différentes isobares

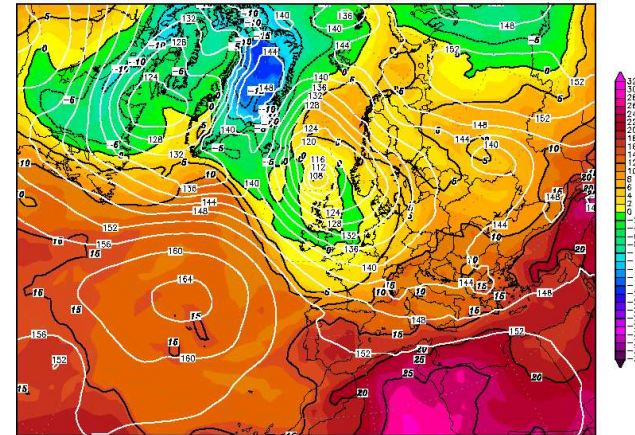
Init : Mon,16SEP2013 06Z Valid: Mon,16SEP2013 12Z
2m Temperatur (Grad C)



Daten: GFS-Modell des amerikanischen Wetterdienstes
(C) Wetterzentrale
www.wetterzentrale.de

Figure 9 : température à 2m le 6 novembre 2009.

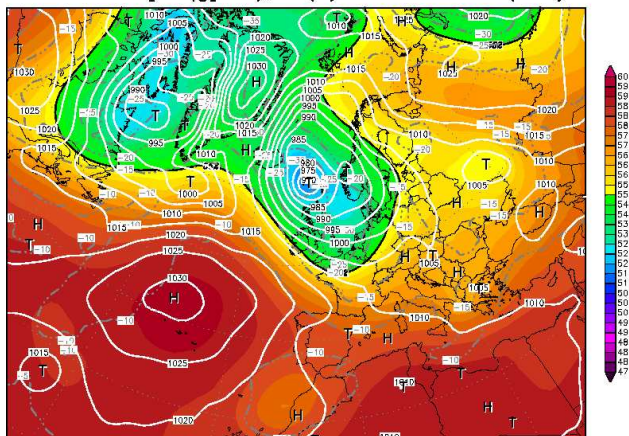
Init : Mon,16SEP2013 06Z Valid: Mon,16SEP2013 12Z
850 hPa Geopot. (gpm) und Temperatur (Grad C)



Daten: GFS-Modell des amerikanischen Wetterdienstes
(C) Wetterzentrale
www.wetterzentrale.de

Figure 10: géopotentiel et température à 850hPa.

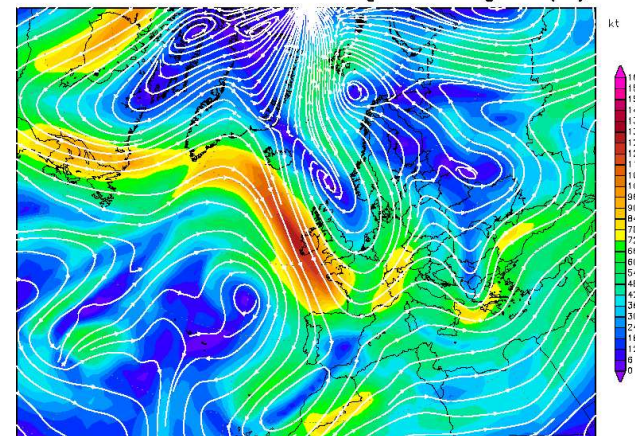
Init : Mon,16SEP2013 06Z Valid: Mon,16SEP2013 12Z
500 hPa Geopot.(gpm), T (C) und Bodendr. (hPa)



Daten: GFS-Modell des amerikanischen Wetterdienstes
(C) Wetterzentrale
www.wetterzentrale.de

Figure 11: géopotentiel et température à 500hPa le 6 novembre 2009.

Init : Mon,16SEP2013 06Z Valid: Mon,16SEP2013 12Z
200 hPa Stromlinien und Windgeschwindigkeit (kt)



Daten: GFS-Modell des amerikanischen Wetterdienstes
(C) Wetterzentrale
www.wetterzentrale.de

Figure 12: la fonction de courant et le vent à 200hPa.

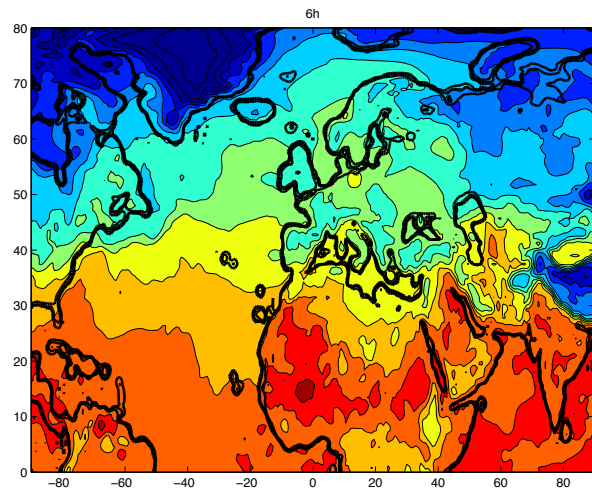


Figure 13 : température à 2m le 28 avril 2008 à 0h UTC.

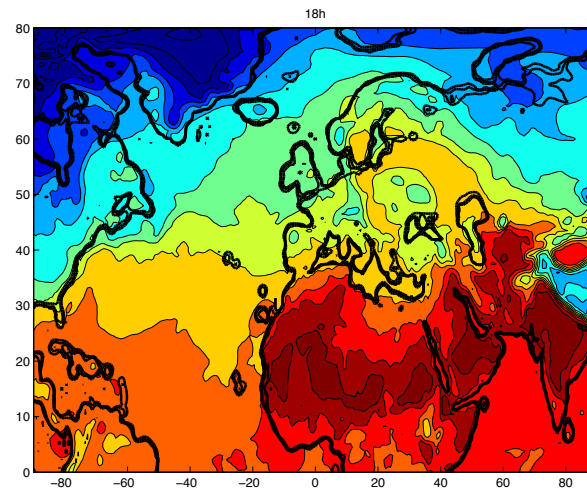


Figure 14: température à 2m à 12h UTC.

T2m est sensible au cycle diurne
 T850hPa l'est beaucoup moins

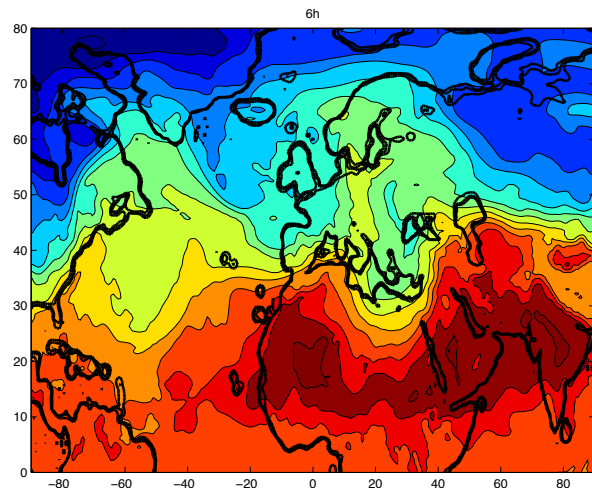


Figure 15 : température à 850hPa le 28 avril 2008 à 0h UTC.

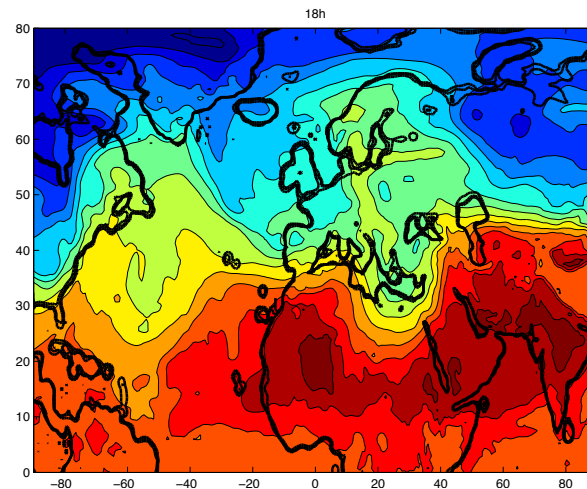


Figure 16: température à 850hPa à 12h UTC.