

# Météorologie dynamique 2

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Référence: « An introduction to dynamic meteorology » de Holton

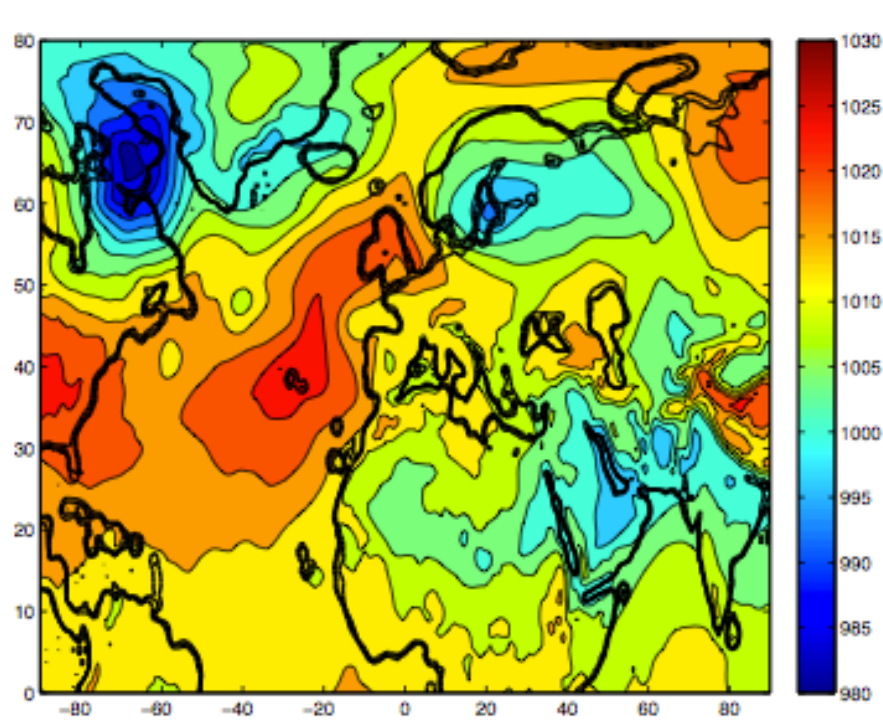


Figure 7 : pression au niveau de la mer, le 14 août 2003.

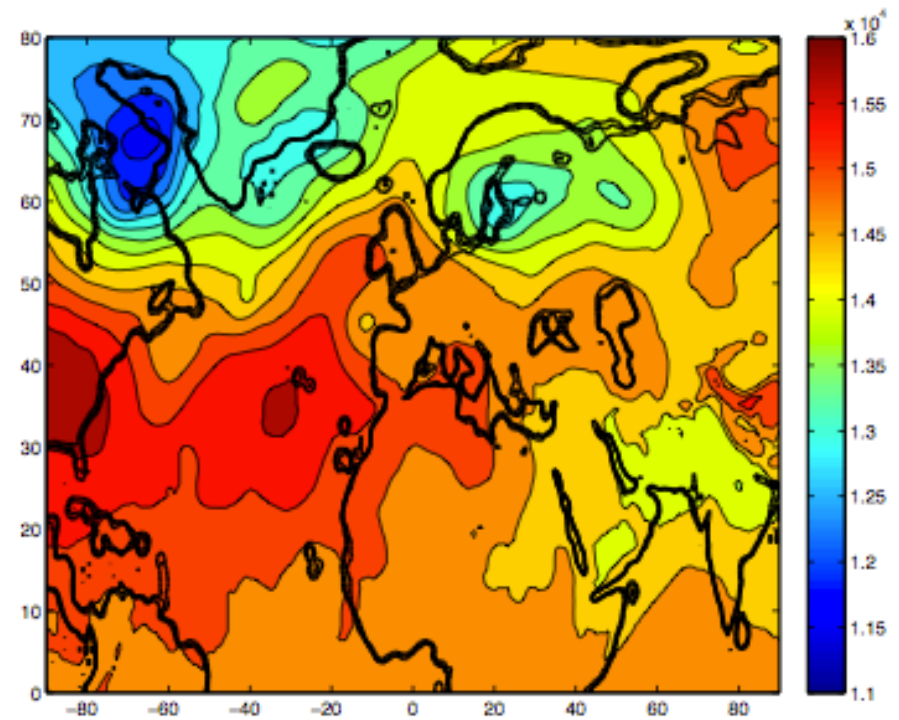


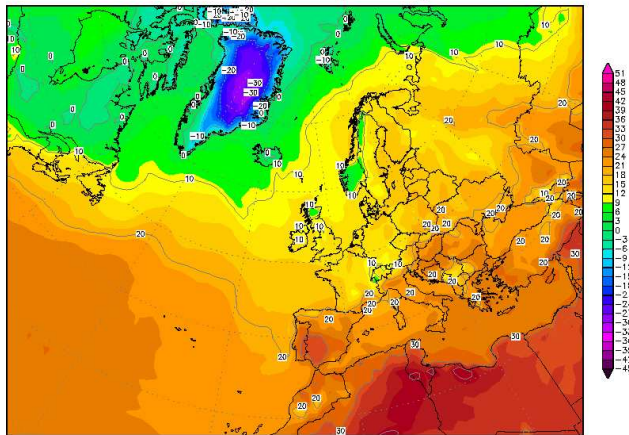
Figure 8 : géopotentiel à 850hpa le même jour.

Faible valeur de géopotiel ⇔ faible pression à altitude constante



# Cartes sur différentes isobares

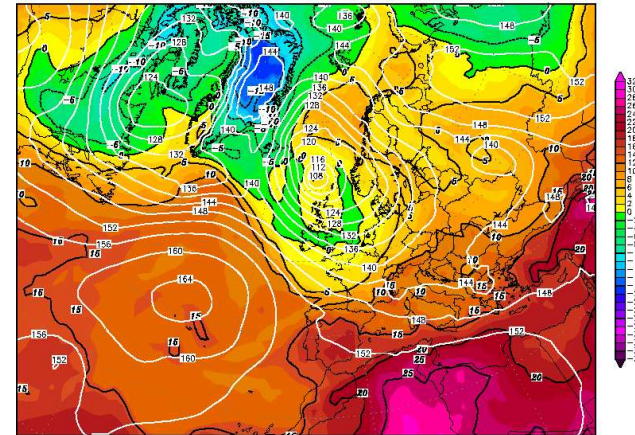
Init : Mon,16SEP2013 06Z Valid: Mon,16SEP2013 12Z  
2m Temperatur (Grad C)



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

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

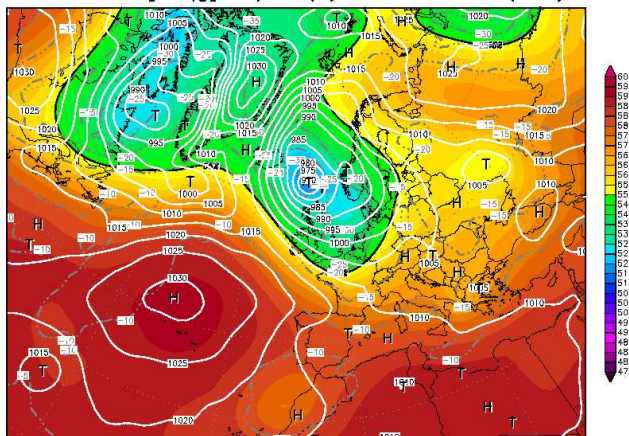
Init : Mon,16SEP2013 06Z Valid: Mon,16SEP2013 12Z  
850 hPa Geopot. (gpm) und Temperatur (Grad C)



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

Figure 10: géopotentiel et température à 850hPa.

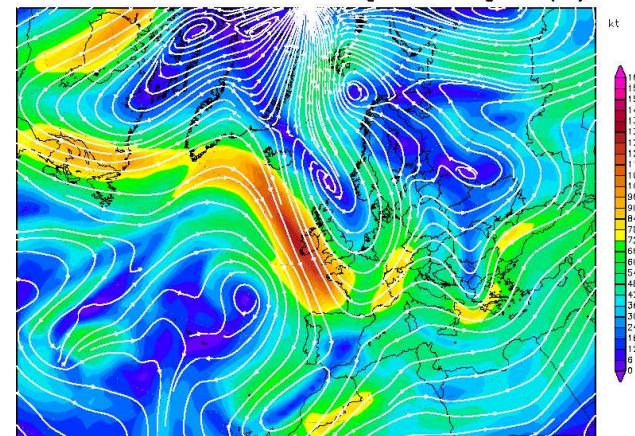
Init : Mon,16SEP2013 06Z Valid: Mon,16SEP2013 12Z  
500 hPa Geopot.(gpm), T (C) und Bodendr. (hPa)



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.

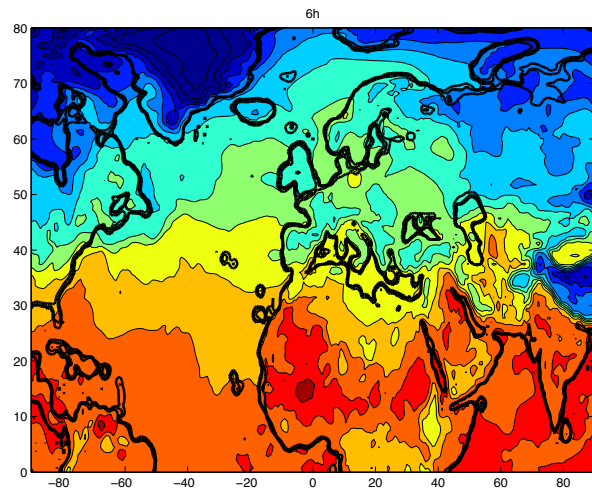


Figure 13 : température à 2m le 28 avril 2008 à 0h UTC.

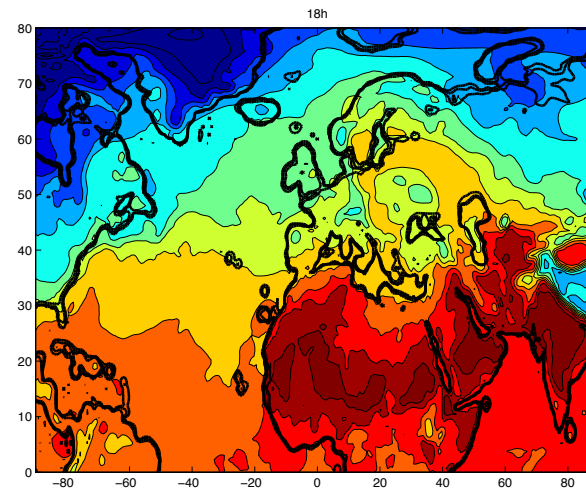


Figure 14: température à 2m à 12h UTC.

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

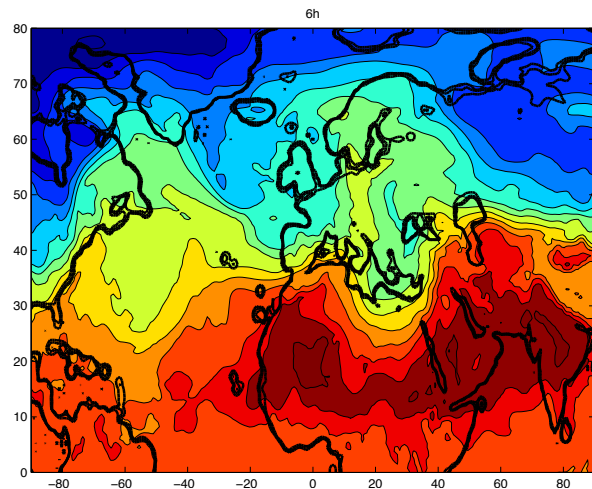


Figure 15 : température à 850hPa le 28 avril 2008 à 0h UTC.

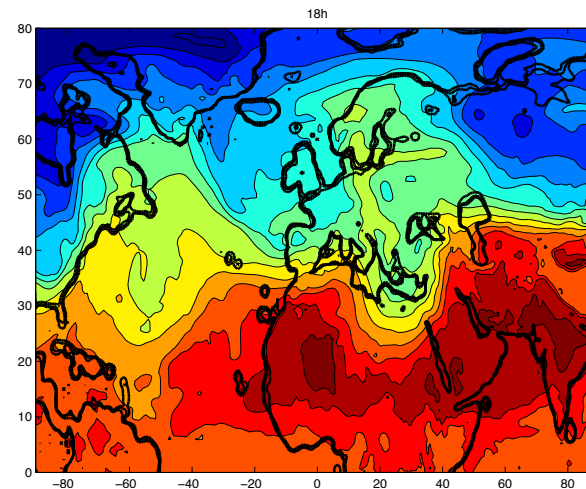


Figure 16: température à 850hPa à 12h UTC.



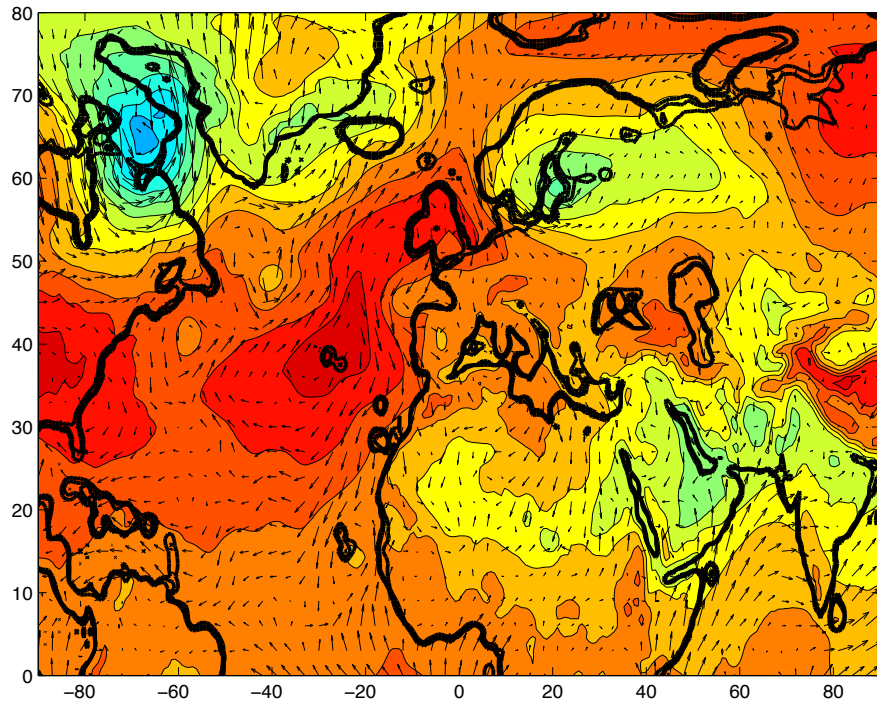


Figure 17 : vitesse à 10 m et pression au niveau de la mer le 15 août 2003.

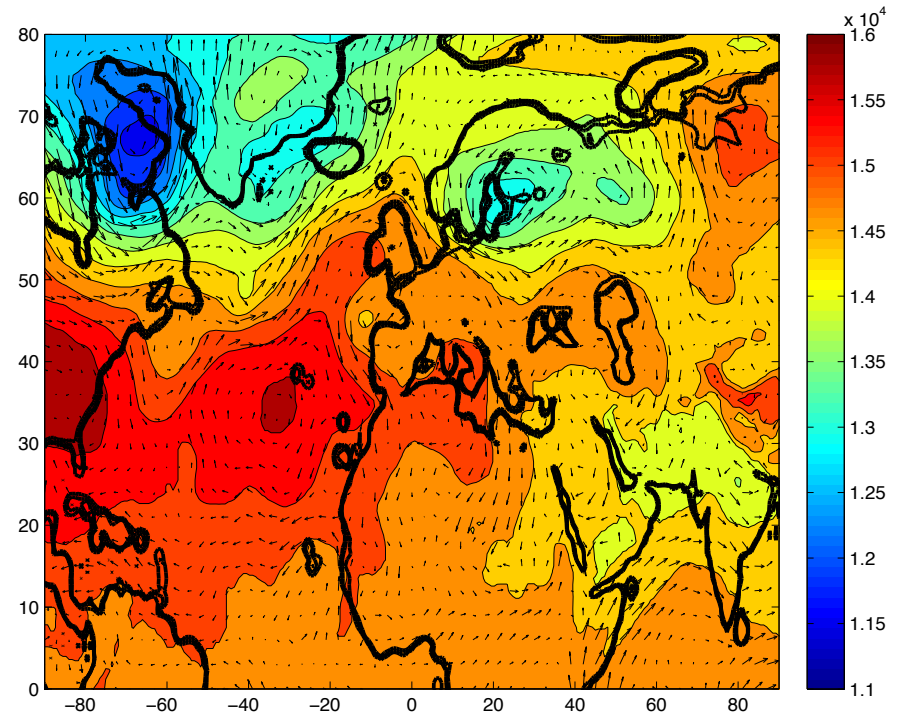


Figure 18: vitesse et géopotential à 850hPa.

circulation cyclonique autour des basses pressions; convergence des vents.  
 circulation anticyclonique autour des hautes pressions; divergence des vents.

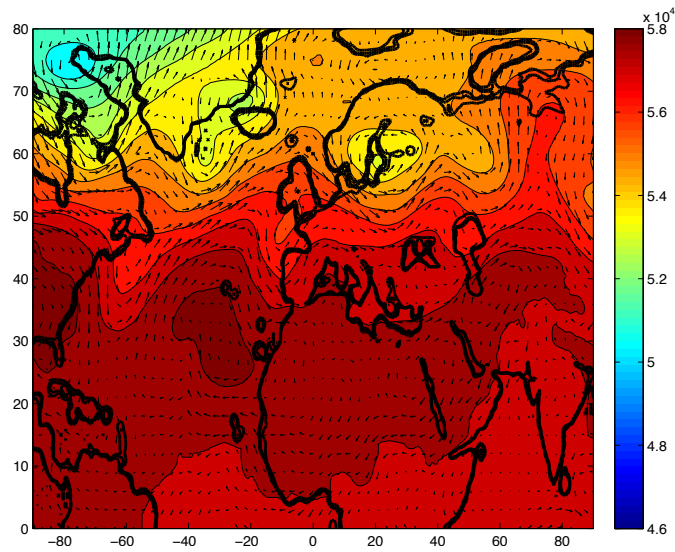


Figure 19 : vitesse et géopotiel à 500hPa le 15 août 2003

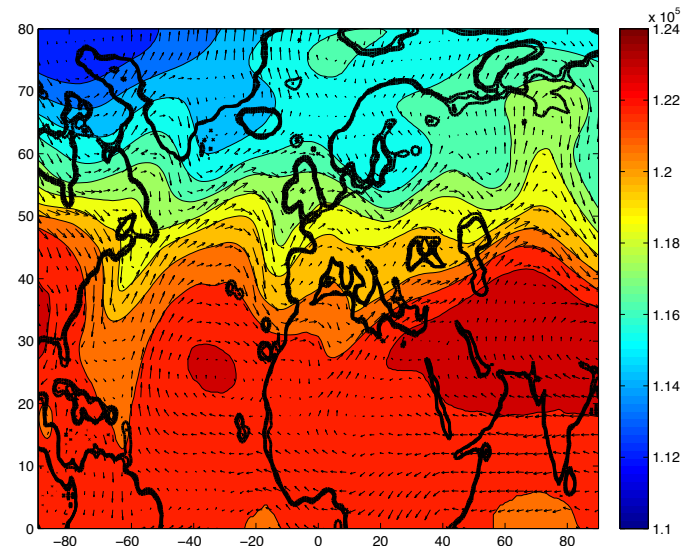


Figure 20: vitesse et géopotiel à 200hPa.

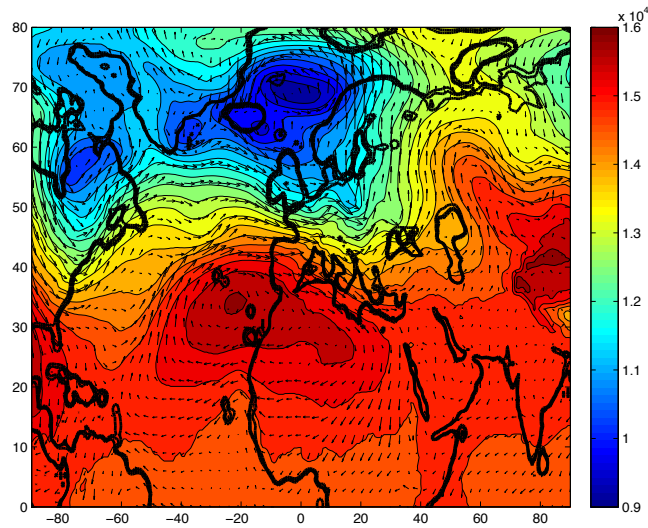


Figure 21 : vitesse et géopotiel à 850hPa le 26 décembre 1999 .

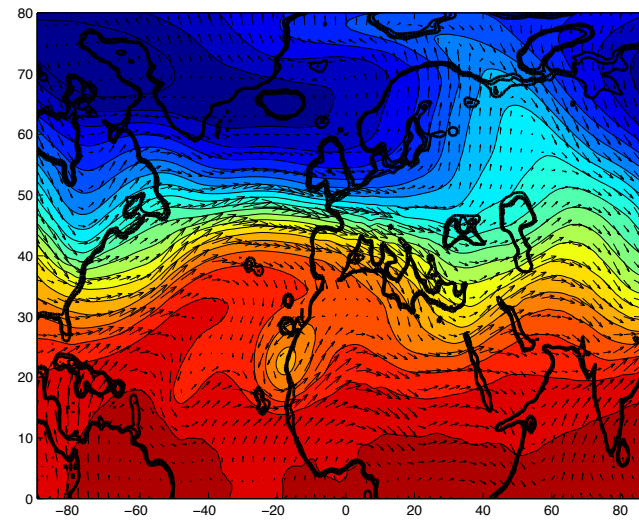


Figure 22: vitesse et géopotiel à 200hPa.

## vitesse des vents et geopotentiel



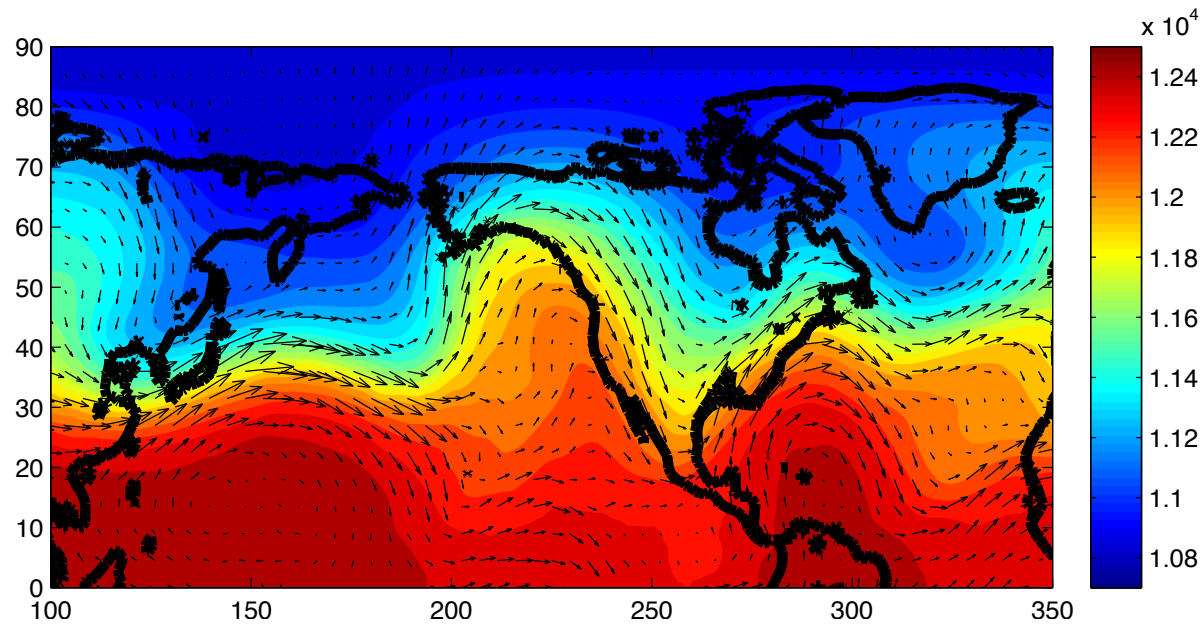
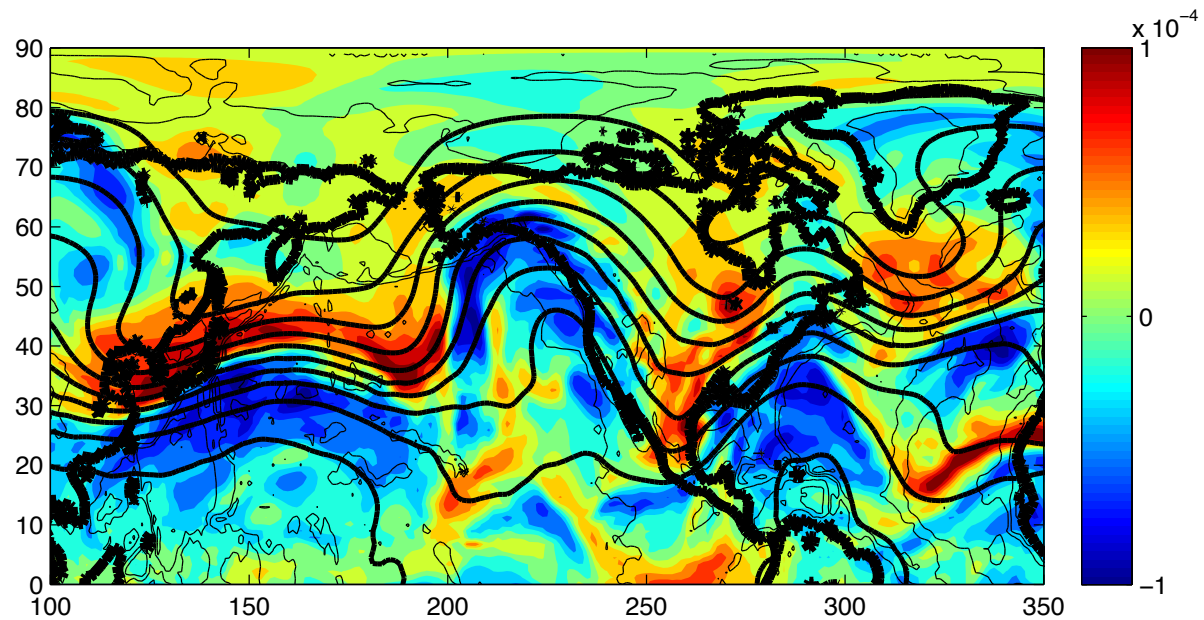


Figure 23 : Géopotiel à 200hPa le 20 décembre 1999

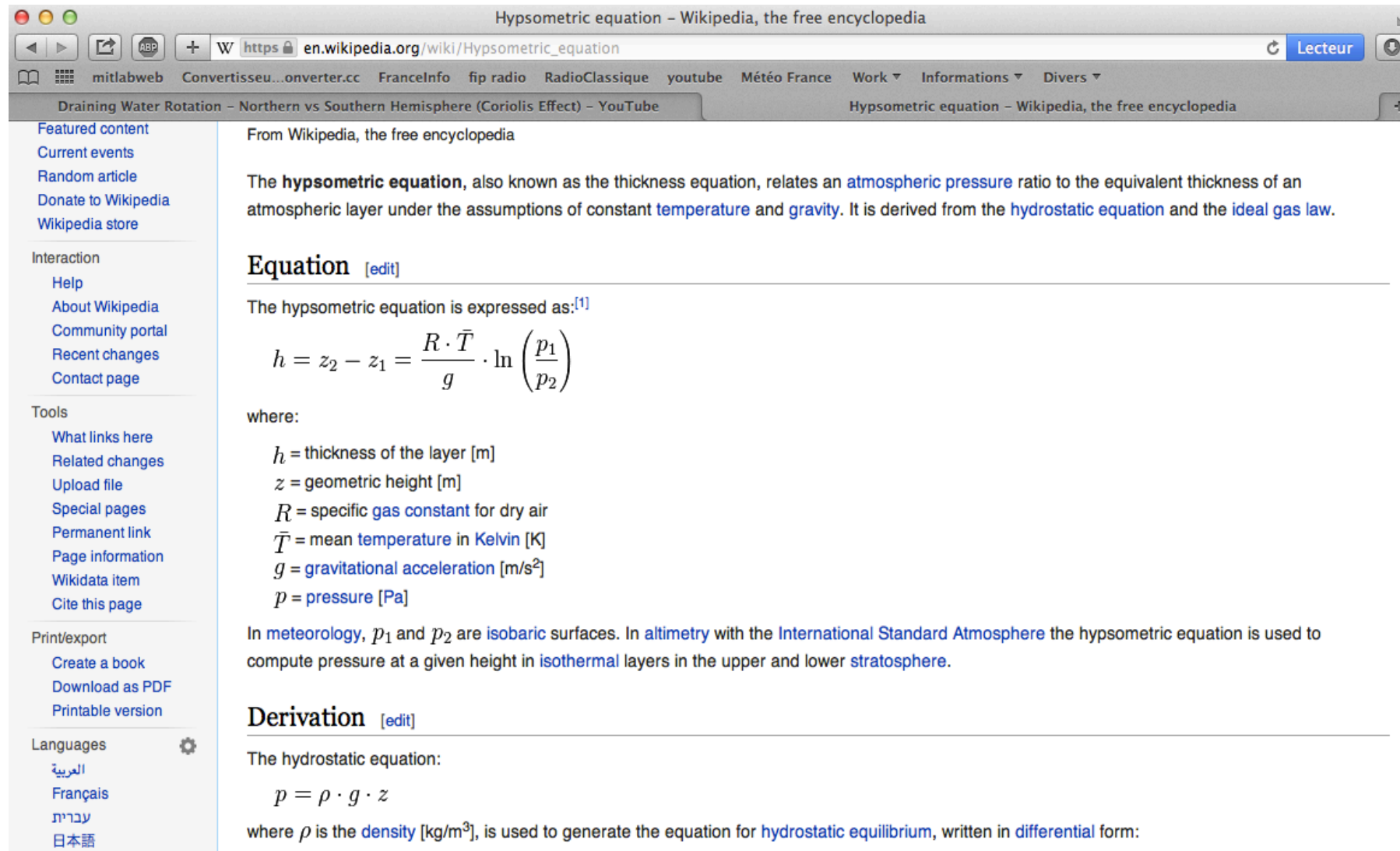


Figures 24 :vorticité relative

vorticite relative et effet de courbure

# Remarque :

## Equation hypsometrique dans la stratosphere



The image shows a screenshot of a web browser displaying the Wikipedia article for the hypsometric equation. The browser's address bar shows the URL [https://en.wikipedia.org/wiki/Hypsometric\\_equation](https://en.wikipedia.org/wiki/Hypsometric_equation). The page title is "Hypsometric equation - Wikipedia, the free encyclopedia". The article content includes a definition, the equation 
$$h = z_2 - z_1 = \frac{R \cdot \bar{T}}{g} \cdot \ln \left( \frac{p_1}{p_2} \right)$$
, and a list of variables:  $h$  = thickness of the layer [m],  $z$  = geometric height [m],  $R$  = specific gas constant for dry air,  $\bar{T}$  = mean temperature in Kelvin [K],  $g$  = gravitational acceleration [m/s<sup>2</sup>], and  $p$  = pressure [Pa]. It also mentions that in meteorology,  $p_1$  and  $p_2$  are isobaric surfaces and that the equation is used to compute pressure at a given height in isothermal layers in the upper and lower stratosphere. A "Derivation" section is partially visible at the bottom, starting with "The hydrostatic equation:" and the equation 
$$p = \rho \cdot g \cdot z$$
.

From Wikipedia, the free encyclopedia

The **hypsometric equation**, also known as the thickness equation, relates an [atmospheric pressure](#) ratio to the equivalent thickness of an atmospheric layer under the assumptions of constant [temperature](#) and [gravity](#). It is derived from the [hydrostatic equation](#) and the [ideal gas law](#).

### Equation [edit]

The hypsometric equation is expressed as:<sup>[1]</sup>

$$h = z_2 - z_1 = \frac{R \cdot \bar{T}}{g} \cdot \ln \left( \frac{p_1}{p_2} \right)$$

where:

- $h$  = thickness of the layer [m]
- $z$  = geometric height [m]
- $R$  = specific [gas constant](#) for dry air
- $\bar{T}$  = mean [temperature](#) in [Kelvin](#) [K]
- $g$  = [gravitational acceleration](#) [m/s<sup>2</sup>]
- $p$  = [pressure](#) [Pa]

In [meteorology](#),  $p_1$  and  $p_2$  are [isobaric](#) surfaces. In [altimetry](#) with the [International Standard Atmosphere](#) the hypsometric equation is used to compute pressure at a given height in [isothermal](#) layers in the upper and lower [stratosphere](#).

### Derivation [edit]

The hydrostatic equation:

$$p = \rho \cdot g \cdot z$$

where  $\rho$  is the [density](#) [kg/m<sup>3</sup>], is used to generate the equation for [hydrostatic equilibrium](#), written in [differential](#) form:



Remarque :

Pourquoi cyclone = sens inverse des aiguilles d'une montre dans l'hémisphère nord VERSUS sens des aiguilles d'une montre dans l'hémisphère sud?

