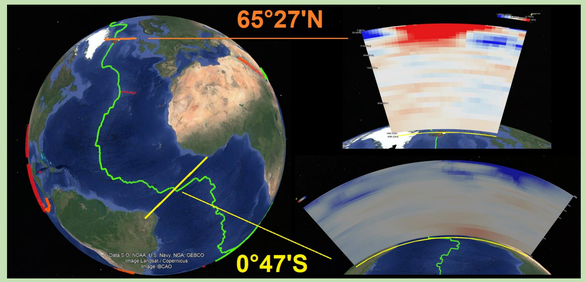
A date with an oceanic core complexes

Isabelle Veltz[1,2,3]

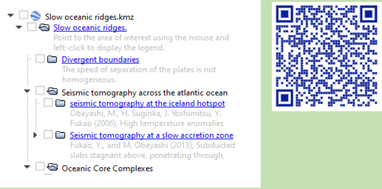
- [1] Université de Reims Champagne Ardenne, Unité de recherche GEGENA, Reims, France,
- [2] Laboratoire des Sciences de la Terre et de la Vie, LTG Roosevelt, Reims, France (isabelle.veltz-balatre@ac-reims.fr)
- [3] Plateforme Eduterre, Ifé, Institut Français de l'Education, ENS, Lyon, France (isabelle.veltz@free.fr)

Observations :
In the Atlantic, only above the hot spot of Iceland can the mantle generate a magmatic oceanic crust, elsewhere the slowness of accretion opposes the decompression of peridotites and the formation of magma.

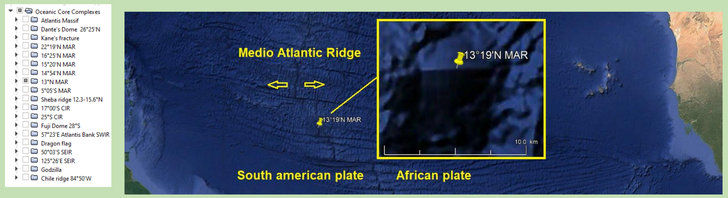


☞ ***Problem*** : By what geological process is the oceanic lithosphere generated in the slow accretion zones?

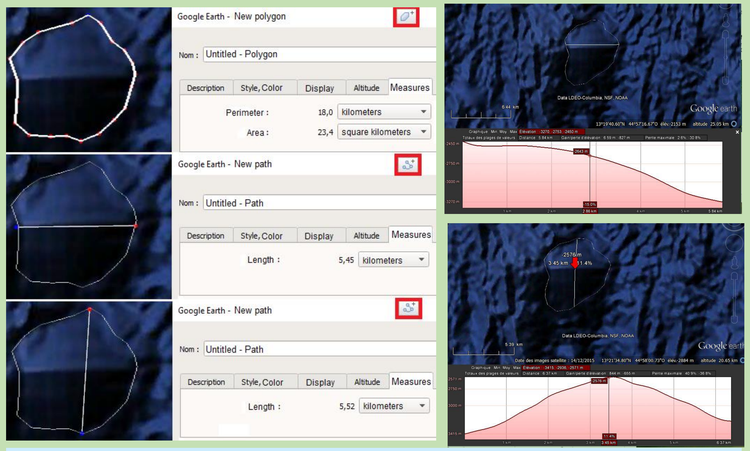
Study support :
- kml file : **"Slow Oceanic Ridge.kml "**
- Google Earth SIG Viewer
- Chronostratigraphic Chart
- Thin sections and rocks



1- Locating OCC in Midle Atlantic Ridge

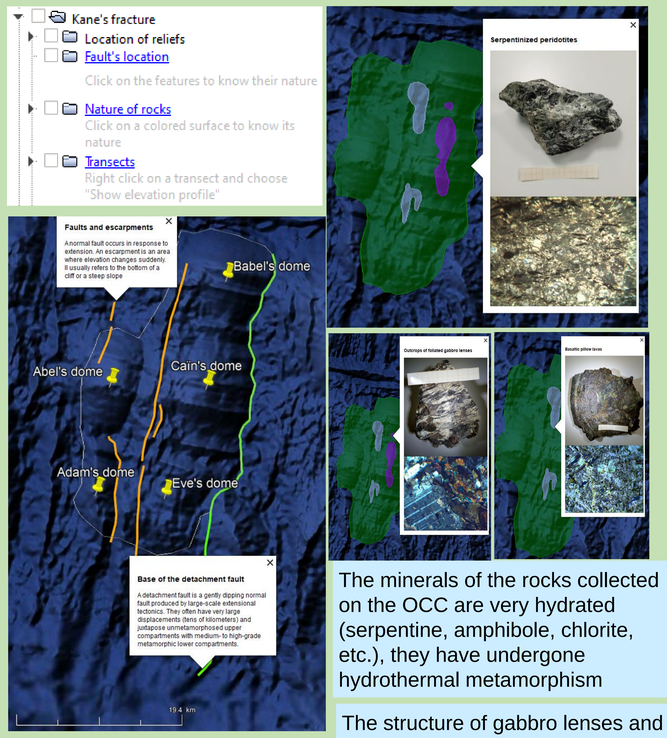


2 - Observing its structure and measure its dimensions with **Google earth tools** (surface, length, width, shape and elevation relative to the ocean floor)



This OCC, located to the east of the ridge forms a dome whose surface is striated and corrugated in a W-E direction

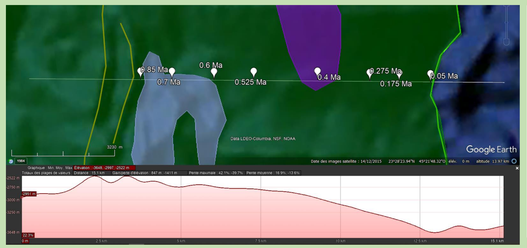
3 Studying its with geological map and samples

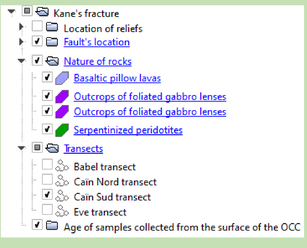


The minerals of the rocks collected on the OCC are very hydrated (serpentine, amphibole, chlorite, etc.), they have undergone hydrothermal metamorphism

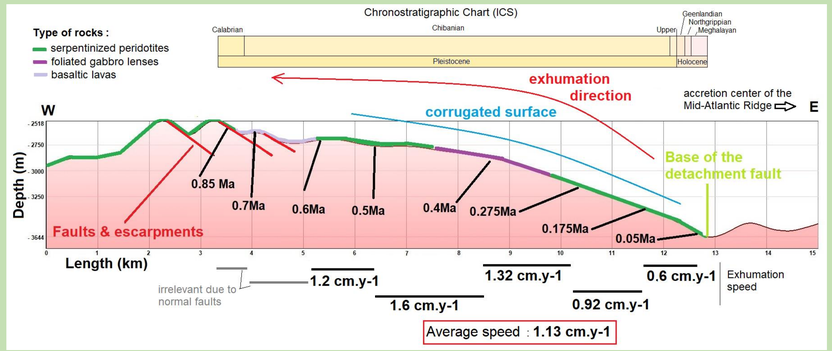
The structure of gabbro lenses and serpentine is layered, showing extensive region

4 Determining the direction of exhumation and its speed





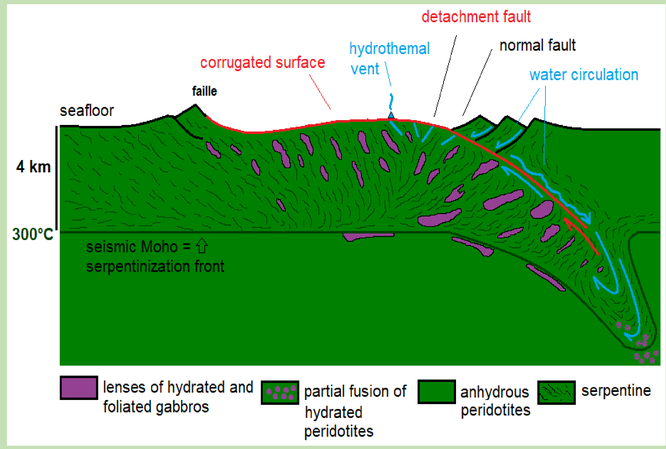
The age of the rocks on the striated surface allows us to calculate the exhumation rate of the serpentinized mantle and the rare magmatic rocks it contains.



It is concordant with the accretion rate of 2 cm.yr-1 measured by GPS

Sharing is encouraged

5 Explaining the principles of its formation



Conclusion :
Divergence processes lead to the tearing of the mantle along large detachment faults that facilitates hydrothermal circulation and promotes partial melting of the mantle. Magmatism is low and the oceanic lithosphere is composed mainly of serpentine.
This hydrated rock forms a soap layer that promotes mantle exhumation and slow oceanic accretion