ID de Contribution: **64** Type: **Poster**

The role of oceanic fracture zones on the dynamics of subduction zones: from natural deformed samples to thermomechanical modelling.

mercredi 27 mars 2024 13:48 (1 minute)

Oceanic Transform faults (OTF) are active, mainly strike-slip, tectonic plate boundaries, which segment Mid Oceanic Ridge axes. Along subduction zones, areas where Oceanic Fracture Zone (OFZ), the seismically inactive extension of OTF are being subducted, seem to be associated with higher seismic activity, thicker crust formation and distinct chemical signatures in produced arc lavas. As all these processes have significant impact on human societies, understanding how and why subducting OFZs influence the dynamics of subduction zones is therefore crucial.

My PhD project is thus two folds. It aims first at investigating the lithospheric architecture of OTF and OFZ through the study of (meta)gabbros deformed and collected at OTF. Samples mainly come from the Vema and Kane segmenting the Mid-Atlantic Ridge. Integrated (micro)structural-petro-geochemical characterization of these samples will be carried out to determine their composition and deformation history, to elucidate the chemical and rheological changes, and fluid-rock interaction processes, occurring in magmatic rocks deforming on OTF. Results and processes will be compared with gabbros, deformed at oceanic detachment faults on mid-ocean ridges. These quantified new compositional and rheological parameters of OFZ will then be implemented in a lithospheric-scale thermomechanical model of subduction including an OFZ. The modelling will be conducted to explore the impact of OFZ-subduction on geochemical cycles and the long-term dynamics of subduction zones, including the nature of metamorphic reactions within the slab, fluid flux, depth of fluid release and stress-strain condition.

Calcium rich Plagioclase and amphibole porphyroclasts, with secondary sodium rich plagioclase and amphiboles primarily constitute majority of the samples. Preliminary petrological analyses indicate high temperature ductile deformation such as recrystallisation, grain boundary migration and undulous extinction in ultra-mylonitic zones, accompanied by brittle deformation such as brecciation and fluid-rock interaction. Formation of amphibolite and greenschist facies minerals such as titanite or sphene, actinolite, chlorite and sodium rich plagioclase during these fracture fill episodes suggest low temperature deformation.

Author: MUKHERJEE, Sampriti (IPGP)

Co-auteurs: Dr PRIGENT, Cécile (IPGP); Dr CANNAT, Mathilde (IPGP); Dr MENANT, Armel (Géoazur)

Orateur: MUKHERJEE, Sampriti (IPGP)

Classification de Session: Pitch Session