ÉCOLE DOCTORALE SCIENCES DE LA TERRE

Subject offered for a contract starting in September 2013

Link between extensional tectonics and nature of fluid-rock interactions in the oceanic lithosphere

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Host lab/ Team **:** **Marine Geosciences Group UMR7154**

Oceanic detachment faults are a key component of lithospheric accretion along slow- and ultra-slow spreading ridges. These structures, that accommodate plate separation at the ridge axis over extended periods of time, are also systematically associated with hydrothermal activity and ultramafic rocks can be sample at their surface.

In Nov-Dec 2013 the ODEMAR cruise will carry out extensive geological and geophysical study of two active detachment faults at the Mid-Atlantic Ridge (13°20-30'N), where lower crustal and upper mantle rocks are exposed to the seafloor. We anticipate that this cruise will provide extensive and widespread sampling of these two tectonic structures and the surrounding oceanic crust. The PhD candidate, that will participate to this cruise, will have the opportunity to investigate the links between deformation, magmatism, and hydrothermal activity and to investigate the mode of lithospheric alteration at oceanic core complexes, in particular the processes of serpentinization. This particular process as gain much interest in the past decade notably as it is a source of hydrogen production. The PhD candidate will also benefit for this study from ophiolitic samples that can be exploited to better understand the nature of the fluid/rock interactions in different geodynamics contexts.

This thesis will be carried out between the Marine Geosciences Group (J. Escartin, J. Carlut, C. Mevel, M. Cannat) and the University of Lyon (M. Andreani), which can provide strong support in all related aspects relevant to the PhD project.

For more information go to http://ed109.ipgp.fr, section: Offres de these (PhD offer), You must apply on the Doctoral School website