



Subject offered for a contract starting October 2017

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**SUBJECT TITLE: *Tomographic study of ocean lithosphere from 0 to 75 My***

Advisor: **Singh, Satish, position (Pr), [singh@ipgp.fr](mailto:singh@ipgp.fr)**

Second Advisor/ Supervisor:

Host lab/ Team : *please fill in and leave out meaningless information*  
**IPGP- Team Marine Geoscience – UMR7154**

Financing: IPGP (European Research Council)

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*For more information go to <http://ed560.ipgp.fr>, section: Offres de these ( PhD offer), You must apply on the Doctoral School website*

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The lithosphere is the upper rigid and solid part of the Earth, which floats over the asthenosphere that flows slowly beneath, and it is the basic building block for plate tectonics. The lower side of the plate boundary, the Lithosphere-Asthenosphere Boundary (LAB), is an active plate boundary that accommodates differential motion between the upper lithosphere and the underlying asthenosphere. Beneath the ocean spreading centres, the thickness of the lithosphere is 2-6 km depth but as the plate cools, it increases to 100 km for a lithosphere of 100 Ma age. However, the precise nature of the LAB and the lithosphere is poorly defined.

In order to image the LAB, an 1800-km long ultra-deep seismic reflection profile was shot in 2015 starting from the Mid-Atlantic Ridge up to 75 Ma in the equatorial Atlantic Ocean. In 2017, we plan to acquire coincident ocean bottom seismometer refraction data in order to determine velocity structure down to 30-40 km depth. In this project, we propose jointly analyse seismic reflection and refraction data to image melts beneath the ridge axis and determine the effect cooling on crustal and mantle velocities of the oceanic lithosphere, and possibly the base oceanic lithosphere. To analyse these unique data, we propose to use state of the art analyses techniques, such as downward continuation, tomography and full waveform inversion.

A student with background geophysics, physics with interest in understanding fundamental geophysical processes is encouraged to apply. The student will be a member of the Paris Exploration Geophysics Group (GPX) and will benefit from its wide-ranging projects and interaction with industry partners.

More information about the project could be found on:

[http://erc.europa.eu/projects-and-results/erc-fundedprojects?f\[0\]=sm\\_field\\_cordis\\_project\\_funding%3AAdvanced%20Grant%20%28AdG%29&f\[1\]=sm\\_field\\_cordis\\_project\\_subpanel%3APE10&f\[2\]=sm\\_field\\_cordis\\_project\\_hi\\_count%3AFrance&page=1](http://erc.europa.eu/projects-and-results/erc-fundedprojects?f[0]=sm_field_cordis_project_funding%3AAdvanced%20Grant%20%28AdG%29&f[1]=sm_field_cordis_project_subpanel%3APE10&f[2]=sm_field_cordis_project_hi_count%3AFrance&page=1)