Subject offered for a contract starting october 2016

SUBJECT TITTLE: Deep crustal structure of the South China Sea conjugate margins.

Advisor: **DELESCLUSE, Matthias, MCF, delescluse@geologie.ens.fr**

Second Advisor/ Supervisor: **PUBELLIER, Manuel, DR, manupub.pubellier@gmail.com**

Host lab/ Team : *please fill in and leave out meaningless information*
ENS- Laboratoire de Géologie de l'ENS- UMR 8538

Financing: Doctoral contract with or without assignment

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

Presentation of the subject: (1 or 2 pages)

The Pacific plate rollback during Mesozoic and Cenozoic times shaped the SE-Asia region with a progressive dislocation of the South China continent and the formation of a series of marginal basins at the edge of Sundaland. Among them, the South China Sea is one of the largest submerged continental province (~1500x1000 km). The South China Sea is thus an exceptional natural laboratory to study the structures and processes taking place from rifting to spreading.

To image the structures and later decipher the mechanical processes accompanying the extension, a 1000 km refraction seismic line (50 Ocean Bottom Seismometers) was acquired through the entire SW South China Sea conjugate margin in 2011 by a Sino-French cruise, followed in 2013-2014 by the acquisition of the coincident multichannel seismic (MCS) profile (6 to 8 km-long streamers).

The first partial prestack time migration imaging of the MCS line show shallow and deep intra-crustal reflectors indicating strong crustal layering. The early refraction velocity modeling, done without any information from the MCS imaging, must be reprocessed in details as the MCS reflectors are also visible on the OBS data. In a second step, once a detailed and robust refraction velocity model will be obtained, the deep crustal velocity will be used to better image the deepest crustal reflectors in the MCS prestack imaging.

The PhD candidate will significantly contribute to the processing effort within the imaging group and also interpret the results in terms of structural geology and fault mechanical processes, as well as compare these results with other margins in the framework of published mechanical models of rifting and extensional faulting.

The Ph.D. candidate will work at the ENS Laboratoire de Géologie (under the supervision of M. Delescluse, assisted by M. Pubellier and N. Chamot-Rooke) and is expected to be willing to travel to China. The ENS geology lab offers state-of-the-art industrial and academic software

for analysis of MCS and OBS data (CGG Geovation, traveltime tomography codes, waveform tomography code...), and good computing infrastructures (cluster...).

The ideal candidate is expected to have a strong interest for geodynamics and geophysics in general, to have good Unix and computing skills, to be ready to manage large datasets, as well as to reasonably read, write and speak English.