

Invited personnel : Dr. Guillaume Richard, Mr. Benoit Bevillard (University of Orleans)

Host researcher : Dr. Hikaru Iwamori (JAMSTEC)

Period : June 24, 2016 ~ July 23, 2016

Purpose : Cooperative research on crustal deformation, particularly concentration of strain.

Seminar information : Dr. Guillaume Richard (University of Orleans), Upper mantle melting and the lithosphere-asthenosphere boundary (at Hokkaido University, 13<sup>th</sup> July, 2016) : Small amounts of H<sub>2</sub>O and CO<sub>2</sub> are predicted by petrological models to produce small degree melting in mantle regions where the geophysical signals of the lithosphere-asthenosphere boundary (LAB) is scrutinized. However, mantle melt dynamics cannot be described as a petrological process alone, since the melt migrates in response to density contrasts with the surrounding solid mantle that, in turns, can undergo compaction. We simulate these coupled dynamics of mantle melting and conclude that they lead to episodic melt focusing that explain most geophysical observations so far attributed to the LAB. The magnitude of the LAB geophysical signal must be related to up-welling motion in the asthenosphere implying that up-welling is common but not a universal rule since several regions display a very weak or no LAB signal.

Report : Concentration of strain is an important elementary process for understanding crustal deformation. By performing (1) field work in the metamorphic-deformation zone of the Hidaka Belt, Hokkaido, (2) discussion on the theoretical and numerical modelling schemes, and (3) acquisition of recent knowledge in the related field in the international conferences, we have constructed the basis for cooperative research.