[JJ] Evening Poster | S (Solid Earth Sciences) | S-SS Seismology

[S-SS15]Fault Rheology and Earthquake Physics

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The goal of this session is to integrate theoretical, experimental, observational, and numerical perspectives from various fields such as seismology, geodesy, geology, mineralogy, and so on, to define what is known about earthquake source processes and the physical and chemical elementary processes of faulting. This session welcomes studies that address such issues as pre-, co-, and post-seismic processes, the rheology of seismogenic faults and fault rocks, laboratory experiments on elementary processes, numerical models based on frictional laws, and estimates of the stress field in the seismogenic zones. We also welcome studies on fault-zone drilling projects and in situ stress measurements.

[SSS15-P02]Paleo-geothermal structure analysis around the Aki Tectonic Line, Shikoku, southwest Japan

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Ancient plate boundary fault and mega-splay fault with product of pseudotachylyte in the Shimanto accretionary complex was observed (e.g., Ikesawa et al., 2003; Mukoyoshi et al., 2006). Mega-splay fault is known as fault which having thermal gap between hanging wall and footwall. This difference is caused by several km cumulative displacement of the mega-splay fault (Konodo et al., 2005; Mukoyoshi et al., 2006). Subduction zone earthquake is generated by activity of plate boundary fault and mega-splay fault (Baba &Cummins, 2005). Thus, investigation of paleo-geothermal structure of around mega-splay fault is important to reveal mechanism of subduction zone earthquake.

The Aki Tectonic Line (ATL) divides the Shimanto belt into Cretaceous northern belt and Paleogene southern belt at the southeastern Shikoku which is considered as ancient mega-splay fault (Ohmori et al., 1997). The ATL extend east and west, and is called the Nobeoka Tectonic Line in Kyusyu and the Nakasuji Tectonic Line in southwestern Shikoku (Murata et al., 1999). The ATL is one of vest subject to trace the outcrop and to reveal lateral heterogeneity of paleo-geothermal structure. However paleo-geothermal structure analysis along the ATL and the other mega-splay fault is limited (Hara et al., 2017). Although some outcrops of the ATL is reported (Suyari et al., 1987; Murata et al., 1999), detail of a part of them is unknown. Moreover, Hara et al. (2016) pointed out that boundary of geothermal structure and age is different at some portion of the ATL.

The aim of this study is to clarify the paleo-geothermal structure around the ATL by Raman analysis of carbonaceous material (CM) and characteristics of fault rock.

This study area is from Aki City, Kochi Prefecture to Mugi Town, Tokushima Prefecture, southeastern Shikoku. In this area, northern belt consist of Cretaceous the Mugi and the Hiwasa formations and southern belt is composed of Paleogene the Nahari and the Ohyamamisaki Formations. The Mugi and the Hiwasa formations mainly consist of mudstone and alternation of sandstone and mudstone. The Nahari and the Ohyamamisaki formations are mainly composed of conglomerate, sandstone and alternation of sandstone and mudstone (Taira et al., 1980; Kiminami et al., 1998).

Estimation of paleo-temperature of host rock of the ATL from Raman spectra of CM is conducted by using equation of Kouketsu et al. (2014). Grains of 20~30 CM in thin section was measured for each samples.
We confirmed at least 5 locations of fault outcrops of the ATL. Strike of those faults is generally EW and dip is 70°N. Paleo-temperature of hanging wall is 250~290℃ at inland area and 200~220℃ at coastal area and those of foot wall is 170~200℃ at inland area and 150~160℃ at coastal area. Thermal discontinuity of 50℃ to 100℃ between hanging wall and foot wall was estimated. This study shows paleo-geothermal structure in this area with some fault outcrop.