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

## [S-SS15] Fault Rheology and Earthquake Physics

convener: Hideki Mukoyoshi (Department of Geoscience Interdisciplinary Graduate School of Science and Engineering, Shimane University), Wataru Tanikawa (Japan Agency for Marine-Earth Science and Technology, Kochi Institute for Core Sample Research), Takanori Matsuzawa (国立研究開発法人 防災科学技術研究所, 共同), Keisuke Yoshida (Tohoku University)

Mon. May 21, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

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.

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## [SSS15-P01] Geochemical anomaly for estimating the slip behavior of an ancient megasplay fault in the Hidakagawa Formation, Shimanto accretionary complex, Japan

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Keywords: megasplay fault, fluid-rock interaction, frictional melting

To understand slip behavior of large earthquakes along subduction zone, investigations in various regions considered trench-parallel heterogeneity in slip parameters are important. Here we targeted an ancient megasplay fault, developed in the Kii Peninsula, Japan, and studied the geological setting and mineralogical and geochemical characteristic by performing Raman spectroscopic analysis, X-ray diffraction analysis, and geochemical analyses of major- and trace-element concentrations of the fault rocks and its surrounding rocks.

The localized slip zone was composed of cataclasite and ultracataclasite, and showed granulation of mineral grains, intense shear foliation and melting grains locally. The results of paleo-temperature estimated by Raman spectra showed the burial depth of 5-9 km and thermal gap of host rock. Geochemical analyses revealed an anomaly of trace-element compositions in the slip zone. Although previous studies assumed single, slip event with fluid-rock interaction, we considered melting flow accompanying with frictional melting and the repetition of slip events. Our numerical calculation of fluid-rock interaction revealed that the ultracataclasite has experienced frictional melting and 271-610 times seismic events accompanying with frictional heat of above 350 °C. In contrast, reported geochemical anomaly in the western ancient megasplay fault, developed in the Shikoku Island, Japan, showed 35-79 times seismic events together with high temperature of above 350 °C by same calculation. This inconsistency reflects trench-parallel heterogeneity of slip behavior.