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

[S-SS15]Fault Rheology and Earthquake Physics

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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.

[SSS15-P12]CMT inversion of the 2016 Yufu, Oita earthquakes using 3D FDM Green functions

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On 16 April 2016 at 1:25 (JST), the mainshock of the 2016 Kumamoto earthquake (M_{JMA}7.3) occurred in Kumamoto Prefecture. After about 32 seconds from the origin time, an event (M_{JMA}5.7) was triggered in Yufu, Oita Prefecture. In this study, we apply a CMT inversion to local strong-motion records of four aftershocks of this event, which occurred in central part of Oita Prefecture on 16 April at 7:11 (M_{JMA}5.4), 8:27 (M_{JMA}3.7), 23:26 (M_{JMA}3.6) and 29 April at 15:09 (M_{JMA}4.5). We employ the CMT inversion technique developed by Okamoto *et al.*(2017, EPS) with 3D-FDM Green functions including topography effect as well as 3D subsurface structure. For the inversion we use velocity waveform data of period range from 10 to 30 seconds, which are obtained by integrating and band-pass filtering the original strong-motion records observed at K-NET and KiK-net stations of NIED, and seismic intensity stations of JMA. An example of the results is as follows: for event of 16 April, 7:11 (M_{JMA}5.4), the centroid location is just under the Yufu volcano and at 1 km depth from the sea level (2.4 km depth from the ground surface), M_W5.1, and the fault strike, dip and rake are N217.0, 88.8 and 109.4 (deg.), respectively. The centroid depth is shallower than the hypocenter of the JMA (5.7 km), JMA CMT (10 km) and F-net CMT depths (5 km). In this region, Matsumoto *et al.*, (2017, EPS) showed that the lower limit of the seismogenic layer is much shallower than the outer region due to the presence of magma and/or related volcano fluids. In this presentation, we will also show the results of the other three events and discuss the relevance to the earthquake triggered by the 2016 Kumamoto earthquakes.

Acknowledgments: we used strong motion records observed at JMA and NIED stations.