[EE] Evening Poster | S (Solid Earth Sciences) | S-CG Complex & General

[S-CG52]Intraslab and intraplate earthquakes

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Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

The purpose of this session is to share recent advances of geo-scientifical studies for intraslab (intraplate) earthquakes. We seek to formulate future directions of the interdisciplinary study of the occurrence of intermediate-depth intraslab earthquakes from the viewpoint of seismology, geodynamics and mineral physics. We welcome presentations from a wide variety of scientific disciplines, including seismology, seismotectonics, geodynamics, mineral and rock physics, other geophysics, geology, and numerical modeling. Studies for outer-rise earthquakes, shallow-depth intraplate earthquakes and deep earthquakes are also welcomed because it is important to know the characteristics of shallow-depth intraslab earthquakes and deep earthquakes for understanding for the generation process of intermediate-depth intraslab earthquakes.

[SCG52-P02]**Waveform Similarity of Deep Earthquakes in the Subducting Pacific Slab Beneath Japan**

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The number of earthquakes in slabs decreases with depth to a depth of ~300 km, but it increases again in a depth range of 400–500 km. The mechanism of this phenomenon has not yet been understood, even though many hypotheses for the origins of deep earthquakes have been proposed. The hypotheses include dehydration-embrittlement hypothesis, shear instability and transformational faulting. In this study, we selected around 600 deep earthquakes (M>3.0) that occurred at depths of >300 km beneath Tokai area in Japan and relocated the hypocenters with double-difference earthquake relocation algorithm (Waldhauser and Ellsworth, 2000). Then, we analyzed waveform data to understand physical factors that control the high seismic activity in the mantle transition zone.
First, we relocated hypocenters with differential travel-time data derived from waveform cross correlations to constrain hypocenter locations with much higher accuracy. Then we found that there were a few seismic clusters with similar waveforms. In the next step, we determined their focal mechanism solutions and calculated their correlation coefficient to evaluate waveform similarity. We focused on several earthquakes showing high correlation coefficient (>0.8) of observed waveforms. We will present detailed hypocenter distributions together with focal mechanism solutions, and discuss their similarities of waveforms.