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

[S-CG52]Intraslab and intraplate earthquakes

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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-P04]**The genesis of seismic clusters in the subducting oceanic crust**

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Beneath northeast Japan, the double-planed seismic zone is observed in the Pacific plate at depths of 70-150 km. The upper and lower seismic planes are characterized by down-dip compressional and tensional stress regimes, respectively. It is supposed that phase transitions in the subducted crust reduce the net volume and these phase changes produce a local tension. Actually, Nakajima et al. (2013) analyzed a seismic cluster at a depth of ~150 km and found that normal-fault earthquakes lie above reverse-fault ones with a separation of ~1 km. They inferred that the volume reduction during phase transformation to eclogite produces a tensional stress. In this study, we estimate focal mechanisms of earthquakes that occur in the upper plane at a depth of ~110 km, where phase transition from jadeite lawsonite blueschist to lawsonite amphibole eclogite may take place, and discuss the genesis of seismicity in terms of the phase transition.

First, we relocated upper-plane earthquakes by double-difference hypocenter location method (hereinafter called “DD method”) [Waldhauser and Ellsworth (2000)], and detected tiny seismic clusters using seismicity density. Then, we relocated earthquakes in each cluster with DD method using high-quality differential-time data derived from cross spectrum analysis. In addition, we read P-wave polarities and determined focal mechanism of earthquakes.

The obtained results show that normal-fault earthquakes lie above reverse fault earthquakes with a distance of 0.1 km. We interpreted that the pair of tensional and compressional stress regimes to be caused by the net volume reduction due to the phase transformation, as considered in Nakajima et al. (2013). Our finding provides new seismic evidence that the stress regime in the slab can be altered over a very small scale by phase-transformation-related stresses.