[EE] Evening Poster | S (Solid Earth Sciences) | S-IT Science of the Earth's Interior & Tectonophysics

[S-IT28]The lithosphere and the asthenosphere

convener:Catherine Rychert(University of Southampton), Hitoshi Kawakatsu(Earthquake Research Institute, University of Tokyo), Samer Naif(共同), Jessica M Warren (University of Delaware)

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The lithosphere-asthenosphere boundary (LAB) separates Earth's rigid tectonic plates from the underlying convecting mantle. The LAB is fundamental to our understanding of plate tectonics and mantle dynamics, although its depth and defining mechanism are highly debated. How it varies among tectonic environments and its relationship to the Moho, MLD, and anisotropy are also poorly understood. Ocean bottom seismic data is particularly important for constraining the young plate with relatively simple history, although this data is difficult to attain and rare. We will focus on the lithosphere, the asthenosphere, and the lithosphere-asthenosphere system in a variety of settings including but not limited to continents, oceans, margins, rifts, ridges, hotspots, plumes, and subduction zones. We welcome research contributions from diverse fields, including but not limited to seismology, magnetotellurics, petrology/mineralogy, dynamical modelling, and mineral physics.

[SIT28-P11]Discordance between P- and S-wave tomography models using ISC travel time data

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Keywords:seismic tomography

We determined P- and S-wave 3D velocity models and compared them. We used travel time data from January 1964 to December 2012, which obtained from arrival-time data reported by International Seismological Centre. For organizing a set of earthquakes, events were selected to distribute globally as evenly as possible. Thus our dataset contains ~14,000,000 paths from ~90,000 events for P and ~1,100,000 paths from ~20,000 events for S. These data were inverted based on the travel time tomography method (Inoue *et al*., 1990; Fukao *et al*., 1992; Obayashi *et al*., 2013) until convergences were archived. Comparing the resultant P- and S-wave tomography models, remarkable high-velocity zones below South America, eastern Australia and the Japan-Izu-Bonin-Mariana region are shown in both models, whereas detailed features are different from each other. Especially in the Izu-Bonin region, high-velocity zones laterally extend significantly near the 660-km discontinuity in the P-wave model (Figure b) whereas S-wave model (Figure c) does not show such significant high-velocity zone. On the other hand, in the depth range from 700 to 1000 km below the south end of the Izu-Bonin trench, high-velocity anomalies exist in the S-wave model, but not so notable in the P-wave model. Previous studies using travel time tomography show similar discordance between P- and S-wave models in the Izu-Bonin region (e.g. Wei *et al*., 2015). Such difference could be caused by different amounts of datasets that P- and S-wave have. Thus we conducted P-wave tomography applying only a set of earthquakes and stations which was used in S-wave tomography (Figure d), and discuss the effect that this factor affects the tomography models.

Figure:P- and S-wave models using all datasets (b, c) and a P-wave model using a set of earthquakes and stations of S-wave (d).