Po/So波から推定した九州下に沈み込んだフィリピン海プレートの地震学的構造
Seismic structure of subducted Philippine Sea plate beneath Kyushu inferred from Po/So waves

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Po/So waves are oceanic Pn/Sn phases that are characterized by their high-frequency (f>2.5 Hz) content, long-duration, and great travel distances (up to 3000km) through the oceanic lithosphere [e.g., Linehan, 1940; Walker, 1977, 1982]. In our previous study [Shito et al., 2013], we demonstrated that Po/So waves develop from the multiple forward scatterings of P and S waves in oceanic lithosphere due to the laminated small-scale heterogeneities. Shito et al. [2015] analyzed Po/So waves in the Philippine Sea Plate, which consists of three regions with different lithospheric ages. They found that Po/So waves propagate more effectively in older regions and demonstrated that the increase in propagation efficiency of Po/So waves depending on the age of the oceanic lithosphere can be qualitatively explained by thickening of the oceanic lithosphere including small-scale heterogeneities and a reduction in the intrinsic attenuation. This study showed that Po/So waves are powerful tool to explore structural variations of the oceanic lithosphere.

Recently, such structural variations (e.g., thickness) of the incoming oceanic lithosphere are supposed to affect seismic and volcanic activity of the subduction zone [Yamamoto et al., 2013; Shibata et al., 2014]. However, it is poorly known that such structural variations of the oceanic lithosphere remain or dissipate after the subduction. In this study, we investigate the structural variations of the subducted Philippine Sea plate by using Po/So waves. We analyze Po/So waves from the earthquakes (mb>3.0, depth>50 km) that occurred in the subducted Philippine Sea slab beneath Kyushu. We compare Po/So waves propagating through different portion of the subducted Philippine Sea Plate and discuss the relation between observed features (velocity and energy) of the Po/So waves and the structural variations of the Philippine Sea plate. We verify that Po/So waves trace deeper extension of Kyushu-Palau Ridge (KPR) that is subducting beneath the Hyuga-nada region.

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