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# Ambient Noise Tomography of the Huatung Basin Offshore Eastern Taiwan

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The island of Taiwan is a young and active orogenic belt resulting from the oblique subduction and collision between the Eurasian Plate and the Philippine Sea Plate, where the Philippine Sea Plate is converging northwesterly toward the Eurasian Plate at a rate of 81 mm/year. In Southern Taiwan, the Eurasian Plate is subducting eastward beneath the Philippine Sea Plate along the Manila Trench. Offshore northeastern Taiwan, on the other hand, the Philippine Sea Plate is subducting northward beneath the Eurasian Plate along the Ryukyu Trench. Between the Ryukyu Trench and Luzon Arc lies the Huatung Basin, a 4000 m deep ocean basin in the westernmost part of the western Philippine Sea Basin. The intertwined tectonic processes result in complex geological structures of Taiwan, from surface to the crust and uppermost mantle. Previous seismic tomographic studies have suggested the effects of collision and subduction on the tectonic structures beneath Taiwan, but the details remain elusive, especially in the crustal depth range, due to limited station coverage and earthquake sources. Recently, ambient noise analysis fills the gap by offering high resolution tomographic model at crustal depths, derived from frequency-dependent Rayleigh wave measurements using noise cross-correlations. A most recent ambient noise tomography of Taiwan has revealed the presence of distinct layered deformation pattern throughout the crust, indicating integrated effect of collision and subduction on the evolution of Taiwan orogeny. However, this study used only land station and thus did not resolve structure in the surrounding region of the island. In our work, we aim to expand such analysis to offshore eastern Taiwan, taking advantage of the data from an OBS network as part of the recent TAIGER experiment. We integrate the data of OBS with that of selected land stations along the east coast, deriving Rayleigh wave Green functions from cross-correlation between all available station pairs. We then calculate dispersion curves at periods from 4 to 20 sec, and invert for phase velocities based on a wavelet-based multi-scale inversion scheme. We also consider variations of anisotropy direction to investigate deformation pattern in the upper 20 km depth beneath the Huatung Basin and adjacent regions, providing a more complete view of the influence of subduction on the Taiwan orogeny.