

Yihe HUANG

Research Report

In the Japan subduction zones, repeating earthquakes are commonly found near the locked regions. In collaboration with Professor Aitaro Kato at ERI, I utilized the rich catalog of small repeating earthquakes to analyze the in-situ material properties of the Japan subduction zones. I measured in-situ V_p/V_s ratios directly using P- and S-wave differential travel times from a waveform cross-correlation technique (Lin and Shearer, 2009; Huang et al., 2016). Our preliminary results from earthquakes in the Kanto region showed a low median V_p/V_s ratio of ~ 1.5 at 60-70 km on the Pacific slab while higher V_p/V_s ratios at 20-30 km on the Philippine slab. The contrasting V_p/V_s ratios and the more active seismicity at 60-70 km indicate that the variations in mineral compositions of fault zone materials may primarily control the locations of repeating earthquakes. The results demonstrate that the comparison of temporal variations in aseismic slip and V_p/V_s ratios will be a powerful tool to understand the relationship between fault slip and fault zone material properties. This project also greatly benefits from the collaboration with Professor Satoshi Ide at the University of Tokyo and Assistant Professor Keisuke Yoshida at Tohoku University as well as the discussions with colleagues at NIED and Tohoku University during my visit. Lastly, I would like to thank the staff at the ERI international office who have offered tremendous help during my visit.

(Received 2023/6/29)