

Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

©2011. Japan Geoscience Union. All Rights Reserved.



SCG062-02

Room:IC

Time:May 27 11:00-11:15

P and S wave tomography in the eastern margin of the Japan Sea

Dapeng Zhao^{1*}, Zhouchuan Huang¹, Norihito Umino¹, Akira Hasegawa¹, Takeyoshi Yoshida¹

¹Tohoku University

We determined high-resolution images of P and S wave velocity and Poisson's ratio under the Japan Sea off NE Honshu using a large number of arrival-time data from local earthquakes in the crust and the subducting Pacific slab. The data were recorded by the dense seismic networks of JMA, Hi-net and Japanese national universities. Our new data collected from 360 crustal earthquakes under the Japan Sea which are relocated precisely with sP depth-phase data are crucial to make this work possible. Our results show that strong lateral heterogeneities exist in the crust and upper mantle under the eastern margin of the Japan Sea, which may have affected the seismotectonics in the region. The crustal velocity variations under the Japan Sea may reflect the complicated geologic structures which were produced during the opening of the Japan Sea and the present compressional stage of the Honshu arc associated with the collision of the Amur plate with the Okhotsk plate. Low-velocity zones in the mantle wedge are found to extend westward under the Japan Sea, rather than just confined under Honshu Island as suggested by the previous studies. This feature indicates that the back-arc magmatism and tectonics are part of the complex geodynamic system under the broad region including the western Pacific island arcs and the East Asian continental margin. The present study also indicates that high-resolution seismic imaging is feasible for the oceanic regions surrounding a seismic network if we can fully exploit the high-quality waveform data recorded by the seismic network, thus the structure and tectonics under the less-instrumental oceanic regions can be investigated well.

Keywords: Eastern margin of Japan Sea, P-wave velocity, S-wave velocity, tomography, slab