

Structural characteristics of oceanic plate in the east off Hawaiian islands, central Pacific obtained by the site survey for uppermost mantle drilling

*Mikiya Yamashita¹, KYAW MOE¹, Kiyoshi Suyehiro¹, Shuichi Kodaira¹, Akane Ohira¹, Seiichi Miura¹, Gregory F Moore²

1. Japan Agency for Marine-Earth Science and Technology, 2. University of Hawaii

Characteristics of the Moho discontinuity and thickness of oceanic crust provide information on original crustal formation. Seismic reflection profiles over old oceanic plates created by fast spreading usually show a strong uniform Moho reflection. Investigations of the structural characteristics of oceanic Moho reflections provides information on the original production of oceanic crust and upper mantle at mid-ocean ridges. The oceanic plate in the central Pacific is not only one of the best locations for seismic investigations, but is also a possible target of deep ocean drilling to the uppermost mantle to study the origin of oceanic crust.

Japan Agency for Marine-Earth Science and Technology and University of Hawaii carried out new multi-channel seismic reflection (MCS) surveys over 1,000 km of line length Northeast of the Hawaiian islands from September to October 2017 to understand the crustal structure of an old oceanic plate. Our survey used a tuned airgun array of 7,800 cu.in. and a 6 km long streamer with 444 channels. We obtained one long MCS transect along a NNE-SSW line (parallel to the spreading direction) and three perpendicular MCS lines. The sediments overlying the upper crust become thinner from west to east. In the east part of the long line, the top of oceanic crust is complicated. Although dipping reflectors in the lower crust are not reported by many studies in old oceanic crust, our survey imaged south-dipping reflectors in the upper crust along NS survey line. The Moho reflections about two seconds below the top of oceanic crust are not so strong nor continuous in our survey lines. We will display the geometry of Moho discontinuity in the east off Hawaiian islands.