The shallow crustal variation by bending effect of the oceanic plate in the east off Hawaiian islands, central Pacific

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There are Hawaiian Arch and Hawaiian Deep as characteristic topographic features around the Hawaiian Islands are shaped by mantle plumes. In the east off Hawaiian Islands, the oceanic crust formed in 80 Ma spread at 8cm/a on the North Arch off-Hawaii. Characteristics of the oceanic crustal reflections, Moho discontinuity and thickness of oceanic crust provide information on original crustal formation. Investigations of the structural characteristics of seismic reflections provides information on the original production of oceanic crust and upper mantle at mid-ocean ridges.

In order to evaluate the transition of the shallow structure focusing on the upper crustal structure using seismic reflection data obtained in the east off Hawaiian Islands in 2017. For high-resolution imaging of shallow structures, high-precision imaging of reflection cross sections was performed by applying prestack time migration velocity analysis using the velocity structures obtained from Ohira et al. (2018) as initial values. We also applied the spectral analysis to the trace of the upper crust for detecting the structural change associated with the alteration.

Our results show the clear image of the top of oceanic crust in the east part of EW line. The sediment thickness decreases from the east to west in the EW line. According to the spectral analysis, the high frequency component was confirmed to be relatively low from the amplitude spectrum of the upper crust west in the EW line. These features suggest the influence of North Arch igneous activity and attenuation by bending the oceanic plate.

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