

The variation of seismic attributes about incoming oceanic crust in Nankai Trough using multi-channel seismic reflection data

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The physical properties of seismic reflection profiles include many geological information with tectonic setting. Nankai Trough is one of the best places to reveal the characteristics about plate boundary of subducting oceanic plate for understanding the large disaster earthquake because there are many exploration data. Japan Agency for Marine-Earth Science and Technology carried out high-resolution multi-channel seismic reflection (MCS) survey in Shikoku Basin along the Nankai Trough by using R/V Kaiyo with high-resolution portable system in 2012 and 2014. To reveal the characteristics of the subducting oceanic plate is important to evaluate the property of plate boundary for understanding the large disaster earthquake. We evaluate not only structure of MCS profiles, but also the variations of reflection strength about the top of oceanic crust of incoming plate.

MCS profiles of lines KY12-4 and SB01 were obtained along the Nankai Trough. These data were valuable for case study by comparison about physical properties from seismic attribute of top of oceanic crust. In order to extract the physical properties from the reflector of top of oceanic crust, we apply seismic attributes analysis for these data. Seismic attributes are measured from seismic data that can be analyzed in order to enhance information that might be well understanding in a traditional seismic image (Turner et al. 1979). The seismic envelope attributes often use the reflection strength of the reflector (e.g. Tsuji et al. 2007). The envelope of seismic attributes means the envelope of seismic signal. These attributes are good for looking at packages of amplitudes. We select the second derivative of single envelope as reflection strength of top of oceanic crust. Although calculated seismic attributes of reflection strength indicate the high intensities in the central part of Shikoku Basin, the west and east part of Shikoku Basin where is initial stage of spreading of Shikoku Basin have the small intensities. This suggests that the reflection strength of top of oceanic crust is affected by the created condition of oceanic crust. We also discuss about the relationship between the reflection strength of top of oceanic crust and the thickness of sediments of Shikoku Basin.

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