



Seismic observed structure of Natsushima 86-2 knoll in Iheya small-ridges of mid-Okinawa Trough, Japan

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Iheya small ridges are the group of the ENE-WSW elongated rod-shaped knolls at the central axis of mid-Okinawa trough back-arc extensional basin. The basin has been actively stretching more than 1000 km long at 250 km west of the convergent boundary between Philippine oceanic lithosphere and Eurasian continental counterpart since ~ 2 Ma (Hsu et al., 2001). Natsushima 86-2 knoll is the westernmost one of the Iheya small ridges which height is 600 m from the 1600 m depth seafloor. Multiple hydrothermal sites have been reported for these 25 years in the mid-Okinawa Trough region while previously well-studied Calyptogena site (Tanaka et al., 1989; Gamo et al., 1991) is just at the northeastern extension of the knoll.

Five profiles of single-channel seismic reflection survey were obtained in Natsushima 86-2 knoll during YK-12-16 cruise in order to find structure controlling hydrothermal activity. Every profile makes the cross-section of the knoll. The source of the reflection was 150 cubic inches G-I gun with 10 seconds interval.

As a result of the interpretation for seismic profiles, it is fair to conclude that the knoll has possible volcanic origin and relatively new structure. Natsushima 86-2 knoll is positioned on the normal faulted stratified deposits which are dipping from the both sides of the knoll. The surface of the knoll shows mostly low amplitude reflection which can be interpreted as pumices or other high porosity materials which is consistent with the past dredging retrieval by Kimura et al. (1987). Bend and fading of the stratified reflection approximately 100 m beneath the Calyptogena site indicates shallow intrusion of magmatic body has responsible with the formation of the hydrothermal site.