

# Tectonic Control of hydrothermal activities in Okinawa Trough

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The Okinawa Trough is located at the backarc area of the Philippine Sea Plate that is subducting beneath the Eurasia Plate with slightly higher convergent rate from 7.4 to 8.3 cm/y. The Okinawa Trough is characterized by the half-graben and/or graben type structure under the extensional stress field that is estimated to occur after Miocene, and remains at the initial rifting stage before backarc spreading stage. The topographic feature of the 1,200 km long Okinawa Trough is bow-like structure and continues from Danjyo Basin, west of Kyushu, to northeastern end of Taiwan. Tectonic trend of the middle part of Okinawa Trough is NE-SW direction and parallel to the general arrangement of the Ryukyu Island-Arc trench system.

The hydrothermal activity accompany with Back-Arc rifting are found in the middle and southern part of Okinawa Trough. Especially, Minami-Ensei Knoll, Iheya Ridges, Iheya North Depression, Izena Hole located in middle part, and Hatoma Knoll located in southern part of Okinawa Trough, have been well investigated by the submersible and surface vessel surveys.

Stratigraphic and geological structures by the seismic survey were carried out by many researchers however very little studies concerning to particular configuration, sedimentary and geologic structure have been done yet. Therefore we analyzed topography and sub bottom structure around the hydrothermal vents that are located in the middle and southern part of the Okinawa Trough by the use of JAMSTEC R/V Kairei. The result makes clear the tectonic control of hydrothermal system by seafloor features. Those are;

Middle part of Okinawa Trough forming a horst and graben structure consists of the NE-SW and/or ENE-WSW trending fault system and changes the direction of NE-SW to the Ryukyu Arc volcanic front. Hydrothermal active areas are only located in NNE and/or NE trending horst area and ENE-WSW trending graben area. On the other hand, the Izena Hole is located in NW-SW trending fault system and volcanic lineament that is forming a segment boundary at the horst and graben structures. Tectonic stress of this area is predominating the strike-slip fault sense accompanying with normal faults with ENE-WSW trend around the Iheya depression. Therefore, the present-day rifting does occur in the Iheya central depression. In conclusion, this activities may be controlled not only by the regional but also by the local tectonic stress fields.