

Tectonic history of the Nosappu Fracture Zone, northwestern Pacific Ocean

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We present the tectonic history of the Nosappu Fracture Zones revealed by the recent research cruises by R/V KAIREI and YOKOSUKA in 2003-2005.

The Nosappu Fracture Zone (NFZ) extends more than 1,000 km from the western edge of the Shatsky Rise to the Kuril Trench (Nakanishi et al., 1989). The NFZ was formed between Pacific and Izanagi plates between Late Jurassic and Early Cretaceous. Magnetic anomaly lineations in the vicinity of the Nosappu Fracture Zone are less easily recognized than those in the vicinity of the Kashima Fracture Zone, perhaps implying that the activity of the spreading ridges near the Nosappu Fracture Zone had been less stable. This implies that the irregular topographic features of the Nosappu Fracture Zone are due to instability of the activity of the spreading ridges.

The detailed bathymetric survey by the multi-narrow beams echo sounder, SeaBeam2112, during R/V KAIREI cruise KR03-07 exposed an echelon arrays of knolls and ridges on the NFZ. Three research cruises were conducted in 2004-2005 to reveal the topographic expression of the NFZ in more detail. We collected magnetic and gravity data as well as bathymetric data in the cruises.

The topographic feature north of 37°40'N is two linear troughs with linear ridges. The depth of the deepest area of the eastern trough is 6100 m. The height of the western trough is become smaller to south. The height of the northern part of the trough is about 700 m and that of the southern part is 200 m. The width of the NFZ is about 30 km at 38°20'N.

We identified magnetic anomaly lineations from chron M15 to chron M12 except for chron M13. The missing M13 lineation implies that the Pacific-Izanagi ridge jumped southward between chrons M14 and M12.