

Magnetic anomaly lineations around the southern part of Mariana trench

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The Mariana trench in the west Pacific Ocean is a plate boundary where the Pacific Plate subducts under the Philippine Sea Plate. The magnetic anomaly lineations of the Pacific Plate was identified near middle and north part of the Mariana trench, but those near southern part were not identified (Nakanishi et al., 1992). It is not settled completely which ocean plate subducting in the southern part of the Mariana trench is the Pacific Plate or the Caroline Plate, which is situated in more south.

The geomagnetic survey in southern part of the Mariana trench was carried out on October 2002 by R/V KAIREI (KR02-13). In this survey, a proton precession magnetometer and a shipboard three-component magnetometer were used and we identified magnetic anomaly lineations using the magnetic data from the cruise with the data of GEODAS and Lamont-Doherty Geological Observatory. We found magnetic anomaly lineations with a strike of N65E. The age of lineations is 146-148 Ma. The spreading half-rate is about 5.5 cm/y.

The strike of magnetic lineations in this studied area is not same as that of near the middle part of the Mariana trench. The strike is closed to that of the Japanese lineation set near the Japan Island (Nakanishi et al., 1992). Consequently it is considered that the ocean plate in the studied area is a part of the Pacific Plate, which was generated at the Pacific-Izanagi ridge.