

### III. MAGNETIC SURVEY OFF SOUTHWEST JAPAN

*Masato Joshima*

Magnetic anomalies in Shikoku Basin have SSE-NNW lineation patterns according to TOMODA *et al.* (1975), who compiled the magnetic data obtained before 1974. During the GH75-4 cruise of the Hakurei-maru the total magnetic field in the south-west sea of Japan was measured by a proton magnetometer and the magnetic anomalies are calculated by deducting IGRF values from the measured values. These are shown in Fig. III-1 by the method of profiles. In this figure the magnetic anomaly data which are measured during the GH 74-7, GH75-3 and GH75-5 cruises are also utilized.

From these data, lineation patterns in the northern margin of the Shikoku Basin, and the magnetic patterns around sea mountains, and anomalies in areas which are shallower than 3000 m have been recognized. South of the Nankai Trough, profiles parallel to the coast of south-west of Japan show short wave lengths, and those that have opposite trends have long wave lengths. These facts indicate a SSE-NNW lineation pattern which is also shown by the contours in the added figure No. 2. These patterns vanish at a depth between 2000-3000 m. The southern part of a sea mount about 150 km eastward from Tanegasima Island has positive anomalies, and the northern part of the sea mount has negative anomalies, indicating normal (equal direction to the present magnetic field) magnetization of the sea mount. Off Miyazaki and the Kii Peninsula there are areas of positive anomalies, and these have also been delineated by airborne investigation. Off the Kii Peninsula the area of positive magnetic anomalies correspond to positive free-air gravity anomalies. Similarly, off the Boso Peninsula the area of positive magnetic anomalies corresponds to positive free-air gravity anomalies which were revealed during the Sagaminada Sea investigations (GH74-1 and GH74-2). However, off Miyazaki the area of positive magnetic anomalies corresponds to negative free-air gravity anomalies. Off Miyazaki the sediment layer is very thick according to the air-gun profiles, so it is generally expected that both gravity and magnetic anomalies will be negative. The reason for the negative gravity anomalies off Miyazaki is not yet clear. WATANABE (1976) thinks that the origin of the positive magnetic anomalies is due to the presence of a large fault. On the other hand off Sizuoka Prefecture there are belts of negative anomalies which appear to have an E-W trending pattern although it is difficult to see any detailed pattern because of poor data. As shown in the area including Oshima and the Izu Peninsula, near the area of volcanic rocks which lie at depths of several hundred meters, the magnetic intensity varies from place to place, so we cannot gain positive information without filtering.

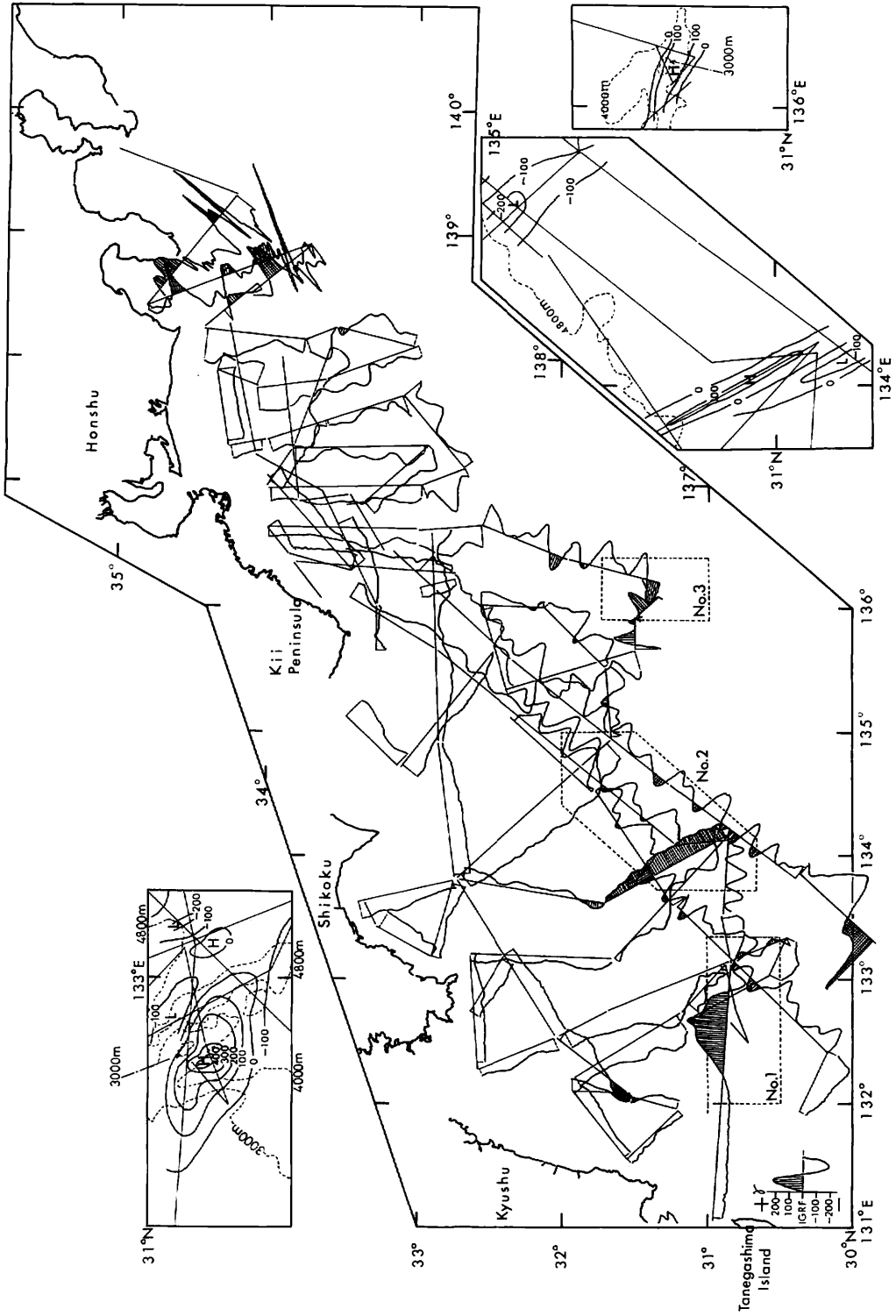


Fig. III-1 Magnetic anomalies in the southwest Japan. In these profiles positive anomalies are shown by oblique lines, and the scale is shown in the left-lower part of the figure. Base line of these profiles were defined to simplify the traverses. Where traverses are congested, contoured maps are made as added figures, with a contour interval of 100.

### References

- TOMODA, Y., KOBAYASHI, K., SEGAWA, J., NOMURA, M., KIMURA, K., and SAKI, T. (1975) Linear Magnetic Anomalies in the Shikoku Basin, Northeastern Philippine Sea. *J. Geomag. Geoelectr.*, vol. 27, p. 47–56.
- WATANABE, S. (1976) Geophysical Study of South Kyushu Based on Analyses of Geomagnetic and Gravitational Anomalies. *Bull. Geol. Surv. Japan*, vol. 27, no. 3, p. 13–32.