

Centroid distribution of magnetized layer in the Philippine Sea deduced from spectral analysis of marine magnetic anomalies

Akiko Tanaka[1]; Takemi Ishihara[2]

[1] Geological Survey of Japan, AIST; [2] Institute of Geology and Geoinformation, AIST

A new global magnetic anomaly data was released [Quesnel et al, 2009]. We used this CM4-corrected [Comprehensive Model 4; Sabaka et al., 2004], cleaned and leveled data to clarify the three-dimensional crustal magnetic structure of the Philippine Sea. One-dimensional and two-dimensional spectral analyses of marine magnetic anomalies [Makino and Okubo, 1988; Tanaka and Ishihara, 2008] were applied to estimate the centroid depths of crustal magnetic layers (Z_0) to constrain the lithospheric structure. There are some limitations in these methods: There are not enough data available to be applied in estimating Z_0 for one-dimensional spectral analysis, and the two-dimensional spectral analysis method remains still controversial. However, both methods give consistent results, and the obtained Z_0 distribution provides a comprehensive view of regional-scale features, which are well correlated with acoustic basement structures [Higuchi et al., 2007] and known tectonic regime. The results show occurrence of shallow magnetic layer areas with approximately less than 10 km in the Shikoku Basin. It also shows variations in deep and shallow magnetic layer areas in the Amami-Daito Province, which corresponds to spatial variation of the crustal thickness and acoustic basement structures. It is expected that Z_0 combined with multidisciplinary data should help to infer geophysical and geological information.