

DOWNWARD CONTINUATION OF MAGNETIC FIELD AND THE MAGNETIC ANOMALIES OF OFFSHORE TAIWAN¹

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ABSTRACT

The $\sin x/x$ method was employed to downward continue the airborne residual magnetic intensities in the offshore area of western and southern Taiwan to the sea surface. The downward continued magnetic anomalies were then contoured and tied with the reduced sea surface measurements in the offshore area of eastern Taiwan to complete a marine magnetic anomaly contour map. The integrated map indicates clearly the older Asian continental structure has been interacted with the younger structures of the South China Sea plate, the Luzon Arc, and the Ryukyu Arc in the vicinity of Taiwan.

INTRODUCTION

In order to explore petroleum resources in the offshore area of Taiwan, the first aeromagnetic survey was carried out in the offshore area of western and southern Taiwan in the spring of 1968. The survey was executed by a U. S. Naval Oceanographic Office Project Magnet aircraft, with scientists of the Chinese Petroleum Corporation participating in all phases of the project. A metastable helium magnetometer was used to measure the total magnetic intensity and a fluxgate magnetometer served as a backup unit. The flight altitude was 180 m above the sea level with track spacing less than 7 km. Approximately 25,000 km of track data were collected over an area of about 85,000 sq km. A residual magnetic intensity map was made by removing the regional field based on the International Geomagnetic Reference Field 1965 (IGRF 1965) from the total magnetic intensities. The map was published in the Technical Bulletin, vol. 3 of the Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas established under the sponsorship of the United Nations Economic Commission for Asia and the Far East (Bosum *et al.*, 1970).

An intensive geophysical survey including magnetic measurements was carried out in the offshore area of Taiwan and Luzon by R/V CHIU LIEN of the Institute of Oceanography, National Taiwan University for the purpose to better our understanding about the structural evolution in the surveyed area. Total magnetic intensities were recorded by a Geometrics proton magnetometer at every 4 seconds with a resolution of 0.5 gamma along all the track lines (total length 13,262 km). The residual magnetic map, prepared after removing the regional field based on IGRF 1965 from the total magnetic intensities, was published in the Petroleum Geology of Taiwan No. 14 (Lu and Kuo, 1977).

This study is intended to integrate the two residual magnetic maps mentioned above into

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