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Geomagnetic Anomalies of the Ilan Plain, Taiwan

SHUI-BEIH YU and YI-BEN TSAI

Institute of Earth Sciences, Academia Sinica

ABSTRACT

In January 1978 a magnetic survey with two proton magnetometers of 1 gamma sensitivity was conducted in the Ilan plain. Two major magnetic anomalies were found and interpreted. One is a steep gradient and large amplitude linear negative magnetic anomaly to the southwest of Ilan city. It may be produced by a linear fracture zone. Another is an east-west trending magnetic anomaly with a total strike length of more than 38 km, extending from Niutou in the west to the offshore area east of Ilan. It is inferred that this anomaly is due to intrusive igneous rocks which might be associated with subduction of the Philippine Sea plate underneath northeastern Taiwan. Thus the igneous Ryukyu Inner Ridge may extend southwesterly into the Ilan plain. Furthermore, the heat source of the geothermal system in Ilan area may be closely related to these intrusive bodies. Based on the N-S trending AA' magnetic profile data and assuming the causative body to be an infinite dike, we estimate the dike width to be 5.5-5.7 km, the depth to the top of the dike to be 1.8-2.0 km, and the center of the dike to be located at a place about 2 km north of Litze.

INTRODUCTION

The Ilan plain is situated in northeastern Taiwan. It is approximately triangular in shape. This plain is an alluvial delta whose topography is very flat. The elevation of the broad area to the east of Yuanshan[1] and Tachou[2] is below 20 m. The Lanyanghsi[3] is the main and the largest stream in the plain. Other streams are much shorter. All streams flow eastward into the sea respectively. The fluviatile deposits are well developed, composed largely of alluvium of clay, sand, and gravels (Tsan, 1976). In the northwest and south border of the Ilan plain are the mountainous region which consists entirely of Eocene to Miocene slightly metamorphosed rocks. The great bulk of the rocks are dark-gray argillite, gray sandstone, white sandstone, slate, and phyllite. The sediments accumulated during Pleistocene and Holocene are distributed in the riverside, foothill, and seashore regions.

We conducted two N-S trending magnetic profiles (station spacing is about 500 m) along the seashore and in the middle part of the Ilan plain in October 1977. A clear magnetic anomaly was found near Lanyanghsi. In order to study the complete feature of this magnetic anomaly and its tectonic implications, a detailed magnetic survey was carried out in the Ilan plain and its surrounding mountainous region during January, 1978. This survey covered an area of about 400 km^2,

1. 員山　2. 大洲　3. 蘭陽溪