TECTONIC INTERPRETATION OF GEOMAGNETIC DATA IN NORTHERN SINAI , EGYPT

T.T. Rabeh (1), G. Duma (2)

(1) National Research Institute of Astronomy and Geophysics, Helwan, Cairo, Egypt, (2) Central Institute for Meteorology and Geodynamics, Vienna, Austria

A detailed land magnetic survey was carried out across the northern part of the Sinai Peninsula in 1999 and 2000 as well aeromagnetic measurements from 1988 to 1990. Based on this data of magnetic total intensity, an intense study was done to identify the main tectonic trends and the basement depth in the area 30°00Š-31°15Š N latitude and 33°00Š-34°33Š E longitude. The main objective of the investigation was to obtain additional information on the tectonic conditions at the Sinai subplate boundary and to compare it with results obtained by other disciplines in that region. Several analysis techniques have been applied to the RTP magnetic data: Spectral analysis technique, Euler deconvolution method, Werner deconvolution method, 2-D magnetic modelling, Analytical signal method as well as the downward continuation technique. The analyses reveal that the most prevailing trend affecting the area is N35°-45°W, which reflects the orientation of the Gulf of Suez - and the Read Sea fault system. Secondly, a N45°-65°E trend is identified, which obviously represents the intraplate fold belt of the 'Syrian Arc' (Moustafa and Kalil, 1990), which extends from Syria in the North to the Western Desert of Egypt in the South, crossing the study area. Another E-W orientation of magnetic anomaly pattern is observed as well. The basement depths range between 1.9 km 3.5 km, the bigger depth appearing in the northeastern part of the area under investigation, whereas the low depths belong to the W and S of the survey region. This may be due to the compressional forces originating from the opening of the Gulf of Suez. The depths of the intrusions range between 0.1 km and 0.4 km.