Geophysical Research Abstracts, Vol. 9, 05014, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-05014

Delineation of subsurface structures and tectonics

of hot spring, central Sinai , Egypt as deduced from magnetotelluric and magnetic data

M. **Mekkawi** and M. Ebohoty

National Research Institute of Astronomy and Geophysics

(NRIAG), Helwan, 11722 Cairo, Egypt

An intensity study has been performed for Hot Spring, central *Sinai, in order to illustrate the role of magnetotelluric (MT) and magnetic interpretation in the detection of* major *subsurface tectonic* structural elements affecting both the sedimentary section and the underlying basement complex. More attention was given to the Hot Spring to spot more light on the subsurface structural features, which control the behavior of this spring. For the *execution of this investigation, MT measurements carried out* with about 10 km distance, in which the Hot Spring is located at the middle of their profiles. According to the results of 1D numerical model, the area is tectonically active and there is a conductive anomaly situated just beneath the hot spring at a depth of 2.2 km. The modeling revealed that, a possible connection between this anomaly and the conductive sediments, which can be considered as the source of the phenomena.

A detailed land magnetic profile were carried out using two Proton magnetometers, one of them as a local reading base station placed in the middle part of the area, while the second was used for measuring the total intensity of the different points. This step was followed by application of the filtered technique, Euler deconvolution and 2D- magnetic modeling techniques. The results of magnetic interpretation revealed that, the Abou Swira Hot Spring is tectonically controlled by faulting having a major NW-SE alignment and extends to a depth of about1. 60 km. The strong magnetic anomalies surrounding the Hot Spring can be attributed to the occurrence of subsurface basic intrusion of high magnetic content. Also the study revealed that, the area has been affected by two main tectonic trends taken the direction NE-SW and NW-SE. The depth estimation to the basement complex indicated that, the basement ranging

between 900m and 1.80 m, and volcanic basaltic intrusions & dykes between 150m and 300 m.