



Approach to determine the geometry of the basement rocks at Sahl El Qaa area, southern Sinai Peninsula, Egypt

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The main target of this work is to configure the geometry of the basement rocks at Sahl El-Qaa area. In general, the structural set-up of the southern part of the Sinai Peninsula is much more complicated due to the presence of different active tectonic forces affecting the area. To achieve this goal, a detailed land magnetic and seismic reflection surveys were performed. The geomagnetic interpretations were carried out using the analytical signal, horizontal gradient, Euler deconvolution, Werner deconvolution and 3D magnetic modelling methods. The results of the interpretations indicate that most of the structures are trending North – South, North 35°-45° West, and E – W. The Aqaba trend (North 15°-25° East) rarely occurs. These tectonic trends could be due to the Gulf of Suez and Red Sea stresses and they are correlated with the surface structural lineaments in the studied area. The Euler deconvolution illustrates that the area is highly affected by these trends. The depths of the basement rocks range from 1 km to more than 2 km below sea level and these results are in agreement with the well log data. In addition, two seismic reflection sections (EG 81-9 & EG 81-29),

compiled by the Egyptian General Petroleum Cooperation (EGPC), were interpreted. They were afterwards correlated with two corresponding magnetic profiles interpreted with the Euler deconvolution method. The results indicate that the sedimentary section was affected by the basement tectonics, as revealed by the two seismic sections, and that the faults extend from the basement upward through the sedimentary section.