

MAGNETO-DEFORMATION ANALYSIS OF GREAT CAIRO, EGYPT

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Detecting crustal movements using of the Global positioning system (**GPS**) has been applied at different seismically active Areas. Egypt is recognized as a moderate earthquake activity region with frequent moderate events. Most of its seismicity is concentrated northern Egypt and around Great Cairo. In order to monitor crustal deformation around Great Cairo, a local geodetic network consists of 8 geodetic points were established in 2004, around potential faults. Four campaigns were performed and processed using Bernese GPS software. The aim of this study is to determine the tectonic elements presented and spot light upon the geodynamic regime of the area. The magnetic results revealed that the main structural trends are NW and NNW. These trends indicate that Red Sea major fault systems have strong influence on the mechanism of rifting that control the present-day deformation. In addition to main Red Sea orientation, predominant NE (Dead Sea-Aqaba trend) and E-W (Tethyan trend) were prevailed.

The velocity vectors for each epoch of observations were calculated and deformation analysis was performed. The horizontal velocity varies between 1 and 8 mm/year in average across the network. The results of the deformation analysis indicate significant contraction and extension across the southeastern part of the study area while, the southwestern part is characterized by an extension strain rates. Also, northeastern part is characterized by significant contraction. The tendency of increasing strain amount resulted from deformation analysis in some locations because of the stress accumulation considered as a precursory for certain earthquake events could be occurred in the study area.

Stress determination, magnetic data and GPS analysis around active faults.