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Geodynamical studies deduced from micro – gravity and geodetic data in Cairo region, Egypt

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Great Cairo region is considered as a very important part in Egypt. Big earthquake with a magnitude of 6.1 on October 1992, occurred at Dahshour area, 35 Km south west of Cairo, so different geophysical and geodetic investigations were carried out in and around this vital area of Egypt.

At the present work, monitoring and analysis of the crustal movements using the Global Positioning System (GPS) and repeated micro gravity measurements are performed on the geodetic points distributed around the Great Cairo.

The investigated area lies in transitional stress regime with a tension axis about NS to NE - SW. The compressional trends E-W, NW - SE, and NE - SW, affect the area and all of these faults are normal. The horizontal movements obtained from analysis of GPS measurements were 8 mm / year.

Preliminary results of the geophysical analysis of time variations in the gravity field of non-tidal type within the limits of the Great Cairo geodetic test site, as well as the relationship between those variations and earthquakes are discussed. It's suggested that the observed variations within the limits of the test site similar to the variations of migration in the gravity field is one of the manifestations of complex processes related to migration of front of elastic stresses occurring in the process of earthquake preparation.

The heat flow in the study area is slightly higher ( $56 \pm 4 \text{ mW/m}^2$ ) than the estimated average (about 44 mW/m<sup>2</sup>). The reason of this might be the concentration of regional stresses due to the intersection of basement and sedimentary rocks in the vicinity of the area.