



## **The contribution of gravity variations in the geodynamical studies in Aswan region ,Egypt**

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### Abstract

Kalabsha region at the NW side of Aswan Lake has been a subject of seismological and geodetic investigations since 1981, after the 5.5 M earthquake on November 14. The following seismic activity was related to the effect of water level oscillations in the lake. Geodetic measurements provided indications of regional stress and local character of vertical movements. As the crucial dynamics represents a hazard potential with respect to the size of the Lake, other techniques have been applied to the monitoring system. Repeated gravity measurements were tested already in the late 1980s and 1994, but only in 1997 till now a new epoch of long-term investigation was initiated.

The measured data showed sufficient accuracy of approx.  $5 \mu\text{Gal}$ . The changes between the different campaigns showed a few important features. First of all, the temporal non-tidal changes of gravity overpass significantly the level of confidence. The changes were compared with older available geodetic data with the conclusion, that the gravity changes are not related directly to vertical movements of the surface. On the contrary, the water loading effect may be expected on the eastern side of the geodetic network, especially in the Kalabsha local net. As the main source of observed gravity changes the development of the stress field is considered. In both Kalabsha and Seiyal nets the changes differ according to relative position of particular measuring points to the faults. Keywords: geodynamics, gravity changes, active faults, Kalabsha fault, Seiyal fault.