



Seismicity and monitoring crustal deformation in and around Egypt using GPS techniques: Implication for Hazards Assessments

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. Studies of crustal movements in Egypt started as early as 1983 following the occurrence of Aswan earthquake in 1981. Several publications were published and presented in local and international meetings.

The first Program for monitoring the crustal deformation has been started in Kalabsha area (Aswan) during the winter of 1983 with the cooperation between NRIAG, and the Aswan & High Dam Authority . The initial measurements were carried out in December 1984 and repeated twice a year till August 1992.

Since the year of 1994 till now, the geodetic observation by means of Global positioning System (GPS) were applied instead of the terrestrial ones to cover some other regions of the country. These regions include Sinai, Gulf of Suez, Greater Cairo, Aswan and the Middle part on the River Nile. Data adjustment and analysis of the repeated GPS campaigns from the Different network, prevailed significant movements which my help in more understanding the geodynamics of the regions. NARIAG has participated in the Eastern Mediterranean project for the Determination of plate's dynamics and interactions using GPS.

From the previous results, we could find there are some correlation between the computed surface deformation and the earthquake occurrences in Local and regional scales. In the regional scales, the Hellenic arc is the region which shows very well this correlation. While In the Local scales, there are some regions in Egypt such as Sinai, Aswan, Greater Cairo and Middle part of the Egypt around the River Nile. We also use the results of computing crustal deformation by means of GPS in studying the stabilities of any area for the purpose of establishing new strategic project and in

planning for the construction of new cities.

Also, we present a GPS-derived velocity field (1988 – 2005) for the zone of interaction of the Arabian, African (Nubian and Somalian) and Eurasian plates. The Velocity field indicates counterclockwise motion of a broad area of the Earth's surface that includes the Arabian plate, adjacent parts of the Zagros and Central Iran, Turkey and the Aegean at rates in the range of 20 – 30 mm/yr. This relatively rapid motion occurs within the framework of the slow-moving (< 5 mm/yr relative motions) Eurasian, Nubian and Somalian plates.