



## **Investigation of the baseline length changes from 1941 to 2007 using terrestrial and GPS measurements along the western part of North Anatolian Fault in Marmara region**

**G. Akay** (1), **H. Ozener** (2, 1)

(1) Bogazici University, Kandilli Observatory and Earthquake Research Institute, Istanbul, Turkey, (2) Istanbul Technical University, Civil Engineering Faculty, Geodesy and Photogrammetry Engineering, Istanbul, Turkey

Detecting and monitoring changes of baseline length method in long time period was applied in this study in order to determine crustal deformations. The distances were calculated from GPS station pairs of General Command of Mapping-Istanbul Technical University (GCM-ITU) Network established along southern strand of North Anatolian Fault. The observations were conducted on the network five times between 1941 and 2007 applying with respectively triangulation, trilateration and GPS methods. The baselines calculated from the adjusted coordinates of triangulation for 1941 and 1963 measurements were considered inaccurate because of inadequate number of observations. Therefore, the analysis part did not contain these observations. Estimated horizontal distances demonstrated that baselines narrowed from 1981 observation to 2004-2007 combined solution in Anatolian fixed reference frame. The distance changes ranged approximately from 4 cm to 43 cm. Between 2004 and 2007 GPS campaigns, on the other hand, baselines where located on the west side of the network became widen up to 2 cm. The results were re-evaluated for GPS campaigns by extending the network with respect to TUBI station in Marmara Region Continuous GPS Monitoring Network (MAGNET). In this analysis, the same baselines also displayed mostly similar behavior in length changes with Anatolian fixed network results.