Geodetic Measurements of Tectonic Deformation around Izmir-Western Turkey

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ABSTRACT:

The Aegean Region and Western Anatolia are one of the most seismically active and deforming parts of the Alpine-Himalayan orogenic belt. An extensional deformation regime has led to subsidence of the continental crust over all regions behind the south Aegean. The region is mainly under pure shear stress from an internally deforming counter-clockwise rotation of the Anatolian Plate relative to the Eurasian one. Izmir is a large city in this region in Turkey with a population of about 2.5 million that is at great risk from big earthquakes. This study aims to investigate the tectonic deformation along the Tuzla Fault and around Izmir by two different geodetic techniques. These techniques are GPS and Precise leveling. A micro-geodetic network consisting of 16 points have been established in the study area. Three GPS and precise leveling measurement campaigns have been realized since 2009. Results show that, horizontal velocities vary between 21mm/yr and 25mm/yr, which are consistent with previous studies.