Geophysical Research Abstracts
Vol. 12, EGU2010-9396, 2010
EGU General Assembly 2010
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The stress state of the region around Inönü-Eskişehir. Active Fault System; interpretations derived from kinematic analysis accompanied with the TUTGA data

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The Central parts of the Anatolian block plays role of stress transferring zone between East Anatolian contractional province and Aegean extensional region in the west during its driven towards west along North and East Anatolian Fault systems. Because of this, various stress regimes characterize and control the different subregions of the Central Anatolia and this situation is reflected by the seismicity of subregions. However the much of the subregions are characterized by strike-slip faultings, the orientations and the trends of the stess tensors are apart from each other. The northwestern part of the Central Anatolia is experienced by İnönü-Eskişehir Fault System which creates a complex stress region with the interactions of the North Anatolian Fault System situated in close north. The İnönü-Eskişehir Fault System is a WNW−ESE striking right-lateral strike-slip deformational area with a normal component that extends from Uludağ in the west to Sivrihisar in the east and separates the western Anatolia extensional region from the central Anatolia to the northeast. This fault system consists of E−W- and NW−SE-trending fault sets and segments which have potential to produce earthquakes in a wide range of magnitutes. Different aged and typed strike-slip basins appear around the Inonu-Eskisehir fault system. One of them is Mahmudiye-Cifteler-Emirdag basin. The Mahmudiye-Cifteler-Emirdag basin is a fault-controlled pull-apart basin in 85 km length and 25 km average width, extending in northwest−southeast trend from Yürükkaracaören village in the North to Emirdag in the South. Because of the recorded GPS data are inadequate for determining characters of the the low velocity deformation in the studied area, the strain rates are computed by using the velocity vectors from TUTGA data. TUTGA network has been established between 1997 and 1999 as covering the Anatolian block, and considering the deformation acquired by means of active tectonic movements of Turkey by determining the coordinate changes at selected particular points. The coordinate variations of the particular points via tectonic plate movements are caused by inter seismic, co seismic, and post seismic effects. 5 TUTGA data are acquired from the General Command of Mapping-Turkey in this study. The obtained construction rate for the studied area is about 65 +- 15 Nanostrain/yr, which corresponds to a contraction rate of 0.9 mm/yr over 10 km. The strain rate results comprising the last ten years calculated from the TUTGA99 data point to a compression in NW-SE trend in the region. This strain rate and orientations are confirmed by the characters of the faults of the İnönü-Eskişehir Fault System.

Key Words: İnönü-Eskişehir Fault System, Mahmudiye-Çifteler-Emirdağ Basin, TUTGA