

# Slip Rates Estimate of Western North Anatolian Fault System in Turkey

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## SUMMARY

Since 1970s, geodetic studies have been carried out for detecting crustal movements along North Anatolian Fault Zone in Turkey. In this context, three geodetic control networks were installed in the regions having significant seismic hazard. One of them is located in Iznik, an area of low seismicity; the other one is Sapanca which is the most seismically active region; and the third network is located in Akyazı where the fault splays in two branches. These networks have been measured by conventional geodetic techniques, then GPS technique has been applied and they have been connected to regional geodynamic GPS Networks. These networks have importance in contributing to the assesment of seismic hazard in the region inferred from episodic GPS observations. Furthermore, two additional geodetic networks has been surveying by GPS technique for several years. These networks are Ismetpasa (established by Istanbul Technical University [ITU] in 1981) and Iznik-HGK (established by ITU and General Command of Mapping in 1941) networks. GPS technique plays a very important role in understanding of earthquake mechanism in each phase of seismic cycle, i.e., the pre-, co- and postseismic stage. Co-seismic movements depend on the amount of slip and the depth of the earthquake. Near-field GPS observations can be used to obtain strain accumulating across locked faults and can therefore help us to determine the seismic potential of the region of interest. It is also necessary to link the short-term geodetic observations to the medium and long-term trends. In this study, we aimed to ensure the continuity of the measurements, examine the change in the magnitude of the velocity vectors, and identify the current velocity field and strain rates through these geodetic networks. The velocities in ITRF2008 reached up to  $24\pm 1$  mm/yr relative to the Eurasia and strain rates indicated up to 98 nanostrain/yr. Directions of the extension and compression showed consistency with present day kinematics of the area.