



GPS velocity field in SE Turkey and NW Syria derived from 2009 and 2010 measurements

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The Hatay triple junction is a tectonically complex area located at the intersection of the left-lateral East Anatolian Fault Zone (EAF), the left-lateral Dead Sea Fault (DSF) and the Cyprus subduction arc. Previous GPS studies indicate 9.7 ± 0.9 mm/yr along the EAF and 2.5-6 mm/yr along the DSF (McClusky et al., 2003; Reilinger et al., 2006; Alchalbi et al., 2009). Tectonic blocks are limited by several well identified active fault segments (DSF, EAF, Osmaniye fault, Karasu fault, Latakia fault, Jisr-al-shuggur fault, Idleb fault and Afrin fault) but their kinematics and related fault-slip rates are poorly constrained. Main issues to address in this region are: What are the velocities (geodetic) and slip rates (geologic) along the three main strike-slip fault systems? How the seismic strain rate may reconcile with the geodetic velocities and can we constrain a slip deficit? What is the role of individual tectonic blocks in the regional deformation?

To address these questions we established a network of 59 campaign GPS stations in NW Syria and in SE Turkey. The first campaign was carried out in 2009 where the 24 points in Turkey are measured in September, with all sites observed for 24 hours over two sessions of 12 hours using Thales Z Max receivers with Thales Z Max Ashtech antenna. The 35 points in Syria were measured in October and November 2009 where each site was observed for one session of 24 hours using Thales DSNP 6502MK receivers with Leica AT504 Choke Ring Antenna. The GPS data were logged with a 15s and 30s sampling rate in Turkey and in Syria, respectively, and antennas were fixed on monuments using antenna masts in order to reduce uncertainty owing to antenna setup. A second campaign took place recently in September and November 2010 where all the sites were measured with the same instruments and method used for the 2009 campaign. The GPS data were processed together with previously collected data from a set of 10 permanent sites in Turkey and 6 others in Syria using GAMIT/GLOBK program. Although the velocity field vectors computed from the 2009 and 2010 measurements appear consistent with other local studies, the results are hampered by large uncertainties. Preliminary interpretations inferred from the regional active tectonics confirm, however, the tectonic block distribution and related GPS results.