



GPS monitoring of the geodetic slip rates at the Carboneras Fault in the SE Betics, Spain

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Starting in 2016, we have initiated a detailed study of the geodynamic behavior of the Carboneras fault (CF), located in the SE Betic Cordilleras of Spain. In our previous GPS studies, we were able to confirm the on-going tectonic activity of the Carboneras fault: resulting in 1.3 ± 0.2 mm/yr geodetic slip rate of the fault, expressed mainly as a left-lateral strike slip motion (Echeverria et al., 2015). Here we present the progress report of the installation of the 3 new continuous GPS stations, established along the fault-perpendicular profile. As a result of combining the data from these newly established stations with the existing CGPS station GATA (established on 2009), we hope, that within several years we will be able to uncover the detailed nature of the crustal deformation around the CF. Most importantly, by having the measurements in the near-field, we hope to determine whether the CF is locked or creeping.

In addition to the installation of the CGPS stations, in autumn 2016 and 2017, we have conducted campaign-style surveys of the 6 CuaTeNeo (Echeverria et al., 2013) and 6 IGN REGENTE geodetic monuments. We have also established and measured 2 new geodetic points in the vicinity of the fault, with the aim of increasing the spatial coverage around it. During the annual campaigns, each of these 14 points were measured during the 3 consecutive days. The campaign data, together with the CGPS data of the surrounding geodetic networks, were analyzed using the GAMIT/GLOBK software from MIT. Here we present an updated GPS velocity field for the CF and the surrounding area. In general, the preliminary results indicate that short-term, geodetic slip rates for the CF are in surprising agreement with the estimates of the long-term, geologic slip rates based on paleoseismic studies, which indicate a minimum strike-slip rate of 1.31 mm/yr and dip-slip rate of 0.05 mm/yr since 110.3 ka (Moreno et al. 2015). Complementary results based on new paleoseismic studies can be viewed in a presentation titled: "Paleoseismic investigations of the Carboneras Fault (SE Iberia): first trenching results at Tostana site" (EGU2018-9650) submitted to TS5.1/NH4.8/SM3.02 session.

Ultimately, as a result of the GPS monitoring of the geodetic slip rates of the Carboneras Fault in the SE Betics, Spain, we hope to better understand the seismic hazard posed by the fault. This work is supported by the project PREVENT (CGL2015-66263-R) financed by the Ministry of Economy, Industry and Competitiveness.