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# Current motion and short-term deformations in the Suez-Sinai area from GPS observations

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We analyze observations from eight GPS campaigns carried out between 1997 and 2005 on a network of 13 sites in the Suez-Sinai area, where separation between the African and the Arabian plates takes place. This is the key area to understand if and in which way Sinai behaves like a sub-plate of the African plate and the role played by seismic and geodetic (long-term) deformation release. Our analysis shows that, on average, the Suez-Sinai area motion, in terms of ITRF00 velocities, matches the African plate motion defined by the NNR-NUVEL-1A model. The horizontal principal strain rate axes estimated separately in the Gulf of Suez area and in the northern Sinai vary from compression across the Gulf to NE extension in the North, showing the presence of two distinct domains, so that in our opinion Sinai cannot be considered simply a unique rigid block. The analysis of GPS baseline length variations shows short-term deformations across the Gulf of Suez, reaching up a maximum value of more than 1 cm in eight years. Since current geodynamical models do not predict significant tectonic deformation in this area, we work under the hypothesis that a contribute may be expected by post-seismic relaxation effects. Under this hypothesis, we compare the baselines length variations with the post-seismic relaxation field associated with five major local earthquakes occurred in the area, testing two different viscoelastic models. Our results show that the detected short-term deformations are better modeled for viscosity values of 1018 Pa s in the lower crust and 1020 Pa s in the asthenosphere. However, since the modeled post-seismic effect results modest and a certain amount of the detected deformation is not accounted for, we think that an improved modeling should take into account the lateral heterogeneities of crust and upper mantle structures.