



Kinematics of the Suez-Sinai area from an updated combined GPS velocity field

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Many studies based on GPS data, have been carried out to shed light on the current kinematics of the Suez-Sinai area, where the interaction of the African and Arabian plates is active. A combined GPS velocity solution covering a wide area from Egypt to Middle East allowed us to infer the current rates across the plate margins. We have estimated 126 velocities from time series of 90 permanent and 36 non permanent GPS sites located in Africa (Egypt), Eurasia and Arabia plates in the time span 1996–2015, the largest available for the Egyptian sites. We have combined our velocity solution in a least-squares sense with two other recent velocity solutions of networks located around the eastern Mediterranean, obtaining a final IGb08 velocity field of about 450 sites. Then, we have estimated the IGb08 Euler poles of Africa, Sinai and Arabia, analyzing the kinematics of the Sinai area, particular velocity profiles, and estimating the 2D strain rate field. We show that it is possible to reliably model the rigid motion of Sinai block only including some GPS sites located south of the Carmel Fault. The estimated relative motion with respect to Africa is of the order of 2–3 mm/yr, however there is a clear mismatch between the modeled and the observed velocities in the southern Sinai sites. We have also assessed the NNE left shear motion along the Dead Sea Transform Fault, estimating a relative motion between Arabia and Africa of about 6 mm/yr in the direction of the Red Sea opening.