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Determining Strain Accumulation Along NAF with Block Modelling

Efe Turan Ayruk¹, Seda Özarpacı¹, Alpay Özdemir¹, Volkan Özbey², Semih Ergintav³, and Uğur Doğan¹

¹Yildiz Technical University, Department of Geomatic Engineering, Istanbul, Turkey (efeturanayr@gmail.com)

²Istanbul Technical University, Department of Geomatic Engineering, Istanbul, Turkey

³Bogazici University, KOERI, Department of Geodesy, Istanbul, Turkey

The North Anatolian Fault (NAF) is a one of the major dextral strike-slip faults of Turkey which forming the boundary between the Eurasian - Anatolian plates. From 1939 to 1999, significant earthquakes occurred as showing a westward migration. Several studies are being conducted due to this seismic activity along the NAF. However, none of these are sufficiently dense to understand the behaviour of the fault. Here we present our block modelling results obtained from combine that published GNSS velocity datasets to determine strain accumulation along the NAF with TDEFNODE software (McCaffrey,1995). Our study area separates to 3 blocks, starts from east of the Sapanca Lake and includes the Karlioiva Triple Junction on the east, extends over the Black Sea on the north and 130 kilometers from the fault on the south. Checkerboard method is used to test the resolution of the dataset, then node distribution on the NAF is optimized and Wang's model is used for inversion solution (Wang,2003). Euler Pole and block strain are estimated with inversion solution for Eurasia/Anatolia plates and the slip deficit variations are estimated for NAF. Under the constrain of the dense GNSS networks, we displayed that some segments of NAF are creeping up to shallow part of the crust and some other segments are locked at deeper region. Herein to better understand latest circumstance of complex slip deficit pattern of the NAF, estimated by our model, we evaluated our results under the complementary present and paleo-seismological datasets.

Keywords: NAF, block modelling, GNSS