



Present-day Arabian Plate Motion constrained by a dense GPS Network in Saudi Arabia

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Previous investigations of present-day Arabian plate motion using GPS measurements were primarily obtained from stations located on surrounding plates, with few stations actually located on the Arabian plate itself. Due to the inhomogeneous distribution of these stations and the fact that some of these were actually located in plate boundary zones, Arabian plate motion was only sensed in a few stable locations of the rigid plate. In order to advance the knowledge of the dynamics of the Arabian plate, the General Directorate of Military Survey (GDMS) in Saudi Arabia, in collaboration with the Institute of Engineering Surveying and Space Geodesy (IESSG) at the University of Nottingham in United Kingdom, has created a dense GPS network of 32 stations in Saudi Arabia, covering nearly two thirds of the Arabian plate. In addition to the 32 GDMS network stations, in our analysis we also considered IGS stations located on the Arabian plate such as BAHR, YIBL, HALY, SOLA and NAMA. Our reference frame implementation is based on 52 IGS stations located on five surrounding plates (Nubian, Somalian, Indian, Eurasian and Anatolian). We have processed all available data from 1 Jan 2000 until 30 June 2007 using the Bernese GPS Software (v5.0), with the new absolute satellite and receiver antenna phase center models together with newly available GPS products from a recent global re-processing effort, and referenced our solutions to ITRF2005. We considered station velocity estimates from a total of 37 GPS stations in the computation of a new plate motion model for the Arabian plate. We will present this new absolute motion model, compare it to previously published studies and show how station selection and distribution was re-

responsible for some of the significantly different estimates. Finally, we will also present Arabian plate motion with respect to the surrounding plates.