



Estimates of Terceira Island (Azores) crustal deformation rates with GPS observations from 1999 to 2006

A. Navarro (1), J. Catalão (1), J. M. Miranda (2)

(1) LATTEX-IDL, University of Lisbon, Portugal, (2) CGUL-IDL, University of Lisbon, Portugal (acferreira@fc.ul.pt / Phone: +351 21 7500830)

Five survey-mode GPS measurements have been made at Terceira Island in the scope of the TANGO and STAMINA projects from 1999 to 2003. From the 22 stations that constitute the actual Terceira GPS network, only 10 stations were observed systematically for all epochs of observation. In 2006 new GPS data was gathered at 15 sites in the framework of the KARMA project. Results are used to evaluate if deformation between the Eurasia and Africa plate at the Azores location is taking place within the island. Campaign measurements were combined with permanent measurements of 12 IGS and EUREF stations using the same reference frame (ITRF2000) for all epochs in order to obtain consistent results. ITRF2000 horizontal velocity vectors are around 21.0 mm/yr at the N38E direction, being in conformity with absolute velocity vectors proposed by some plate motion models considering stable Eurasia. Analysis of GPS observations, for a time span of approximately 7 years for 10 stations and 5 years for 5 stations, suggests that the island is apparently stable, with relative horizontal displacements that range from 0.2 to 3.2 mm/yr, at 95% confidence level. Estimates of the strain rate field reveal areal contraction of about -0.22 ± 0.03 ppm/yr for the island. Predominant contraction, of around -0.14 ± 0.02 ppm/yr, is observed in the NNW-SSE direction, corresponding to a shortening of about 2.4 mm/yr in that direction. A clockwise rotation of approximately 0.04 ± 0.02 microradians/yr (around 2.1 ± 0.9 degrees/Ma) was obtained for the island.