Geophysical Research Abstracts, Vol. 9, 05314, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-05314

Crustal deformation in Eastern Betics from CuaTeNeo GPS network

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We present the crustal deformation field in the Eastern Betic Cordillera of Spain, based on three GPS observations of the CuaTeNeo network (1997,2002 and 2006), which was setup with a specific aim of evaluating the earthquake related hazard in this seismically most active area of the Iberian Peninsula. The network consists of 15 highly stable monuments, covering $\sim$6000 km^2 area in the Internal zone of the Betics, which consists of mountain ranges of metamorphosed Paleozoic and Mesozoic rocks separated by Neogene intermontane basins. The most recent phase of the Internal Zone evolution is related to the formation of these basins and their rapid uplift since Pliocene, due to the continuing convergence of the Africa and Eurasia plates.

The calculated deformation field is complex and shows evidence for localized deformation related to the existing active faults within the area (e.g. Alhama de Murcia and Carboneras faults). The geodetically determined rates of present-day crustal deformation in the SE Betics are of the order of 0 to 4 mm/yr. The average strain rate for the entire network is uni-axial (-0.06$\pm$0.009 μstrain/yr), where the orientation of the maximum strain rate coincides with the convergence direction of the Africa and Eurasian plates, suggesting that the main driving force behind the observed deformations are related to the plate tectonics, specifically to the Africa-Eurasia convergence.