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Crustal deformation along the Northern Hyblean Plateau margin (Sicily, Italy) from GPS measurements and comparison with stress data

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In this work we analyze data from permanent and non-permanent GPS stations collected between 1998 and 2006 on a dense geodetic network covering a large area of the Hyblean Plateau (southern Italy). This is a seismogenetic area, where strong earthquakes destroyed many cities and killed thousands of people in the past. The analysis of geodetic velocities referring to an Eurasian and an African reference frames, reveals the occurrence of active shortening in the northern sector of the plateau along the boundary defined by the Gela-Catania Foredeep, coupled with an active lengthening in the central sector of the plateau itself. Starting from the estimated velocity at each station, the horizontal strain-rate field of the Hyblean Plateau was calculated. The strain rate pattern clearly defines an area of a prevailing N-S compression along the northern rim of the Hyblean Plateau. Furthermore the central sector of the plateau is affected by a NNW-SSE and NE-SW extensional strain rate pattern. A comparison with seismological and structural data, available for the studied area, allows improving the knowledge of the tectonic processes in the Hyblean Plateau and their implications for seismic hazard.