

Geodetic deformations in the Central-Southern Apennines (Italy) from repeated GPS surveys

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Abstract

We computed the horizontal strain rate field for a sector of the Central-Southern Apennines (Italy) from GPS data collected during yearly repeated campaigns performed from 1994 to 2000 on the GeoModAp (Geodynamic Modeling of the Apennines) geodetic network. Site velocities were obtained starting from the daily coordinates and covariance solutions, using a Kalman filter approach. The residual velocity field with respect to a Eurasian fixed reference frame shows two different prevalent motion trends, NE-ward for the eastern sector of the network and NW-ward for the western one. The mean strain rate tensor, obtained from a least square inversion method, shows a significant extensional deformation (1.2×10^{-8} strain/yr) normal to the Apennine chain, in agreement with seismological and neotectonic data. On the basis of the network dimension, of about 250 km, this value gives a well constrained estimate of about 3.0 ± 0.2 mm/yr of the extensional velocity oriented N55E, normal to the chain axis. Our results show a transition of the strain rate field from about N-S compression in the Tyrrhenian side to about NE-SW extension toward the Adriatic, which depicts a more complex deformation pattern.

Keywords

Geodesy;GPS;central-southern apennines;strain rate;seismotectonic

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
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