

Geodetic deformation Across the Central Apennines from GPS Data in the time span 1999–2003

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Abstract

Abstract During the time span 1999–2003 was set up and repeatedly surveyed a not permanent GPS network located across one of the highest seismic areas of the central Apennines (Italy). The Central Apennine Geodetic Network (CA-GeoNet), extends across Umbria, Abruzzo, Marche and Lazio regions, in an area of $\approx 180 \times 130$ km, from Tyrrhenian to the Adriatic sea. It consists in 125 GPS stations distributed at 3–5 km average grid and includes 7 permanent GPS stations operated by the Italian Space Agency (ASI) and the Istituto Nazionale di Geofisica and Vulcanologia (INGV). With the aim to estimate the active strain rate across this part of the chain, the GPS sites have been located on the main geological units of the area and across the typical basin and range structures, related with the main seismogenic faults. In this paper we show the network and the first results obtained for a subset of 23 stations that have been occupied at least during three repeated campaigns, in the time span 1999–2003. Data analysis, performed by Bernese 4.2 software, shows an extensional rate normal to the chain, in agreement with geological and seismic data. The strain rates in the inner chain are ranging from $12 \times 10^{-9} \pm 11 \text{ yr}^{-1}$ to $16 \times 10^{-9} \pm 11 \text{ yr}^{-1}$ and from $-14 \times 10^{-9} \pm 11 \text{ yr}^{-1}$ to $-3 \times 10^{-9} \pm 11 \text{ yr}^{-1}$. This result provides an improved estimation of the ongoing deformation of this area with respect to previous studies and is in agreement with the style of deformation inferred from seismicity and with the features of the main seismogenic sources from recent geological and seismological investigations.

Keywords

Geodetic; Deformation; Gps; Apennines

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References

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
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