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Present day crustal deformation of the Italian peninsula observed by permanent GPS stations

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Italian penisula is a crucial area in the Mediterranean region to understand the active deformation processes along Nubia-Eurasia plate boundary.
We present the velocity and strain rate fields of the Italian area derived from continuous GPS observations of more than 300 sites in the time span 1998-2009. The GPS networks were installed and managed by different institutions and for different purposes; altogether they cover the whole country with a mean inter-site distance of about 50 km and provide a valuable source of data to map the present day kinematics of the region.
The data processing is performed by BERNESE software ver. 5.0, adopting a distributed session approach, with more than 10 clusters, sharing common stations, each of them consisting of about 40 stations. Daily loosely constrained solutions are routinely produced for each cluster and then combined into a network daily loose solution. Subsequently daily solutions are transformed on the chosen reference frame and the constrained time series are fitted using the complete covariance matrix, simultaneously estimating site velocities together with annual signals and sporadic offsets at epochs of instrumental changes.
In this work we provide an updated detailed picture of the horizontal and vertical kinematics (velocity maps) and deformation pattern (strain rate maps) of the Italian area. The results show several crustal domains characterized by different velocity rates and styles of deformation.