The INGV-CNT crustal motion map for the Euro-Mediterranean region

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Several thousands GPS/GNSS permanent stations, managed by both scientific and cadastral institutions, are now available on the European plate and its boundaries. The data coming from these stations provide unprecedented spatial and temporal coverage of time-dependent deformation signals essential to understanding the fundamental physics that govern tectonic deformation, faulting, and fluid transport. The National Earthquake Center (Centro Nazionale Terremoti, CNT) of the National Institute of Geophysics and Volcanology (Istituto Nazionale di Geofisica e Vulcanologia, INGV) in Italy, is the Italian leader institutions for the collection, management and scientific analysis of Global Positioning Systems (GPS) measurements. Distinct analysis centers independently and routinely process and analyse data using high-quality geodetic software (Bernese, Gamit, Gipsy) to measure the movements of > 1000 points spanning the Eurasian plate and its boundaries. The goal of this project is to offer high-quality geodetic products, increase their accessibility to the European scientific community and promote the inter-disciplinary data exchange through a multi-level, user-friendly data gateway. The access to the data products delivered by this project will require the construction of appropriate web services for mining, visualisations and download the geodetic products (time series of different parameters, maps). These activities will be performed in strict contact with the GNSS Working Group of the EPOS project (http://www.epos-eu.org) that is proposing to integrate, archive and distribute data, metadata and products for available GNSS stations on the European plate. In this work we will present: 1) the distinct solutions in a Eurasian reference frame obtained by different software (Bernese, Gamit, Gipsy) and approaches; 2) the analysis of noise characteristics of the different solutions; 3) a study on the optimal strategies to combine multi-software solutions (combination at position or velocity levels); 4) strain rate maps of the Eurasian plate and its boundaries.