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Active tectonics across the Central Apennines (Italy) from geodetic and geomorphologic investigations

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Insights about active deformation in the Central Apennines are derived from the distribution of the historical and instrumental seismicity and from geometry and kinematics of active fault systems. The focal mechanisms of the strong earthquakes define deformation rates ranging between 0,9 and 3,5 mm/yr while VLBI and GPS data highlight deformation rates ranging between 3 and 6 mm/yr (Serpelloni et Al., 2001). In order to cast light on the complex regional kinematic pattern, characterised by faults inherited from the pre – Quaternary tectonic regime, but responsible for the formation of Pleistocene intramontane basin, the geodetic GPS network, "CA_GeoNet (Central Apennine Geodetic Network), was set up and monitored by the Istituto Nazionale di Geofisica e Vulcanologia since 1999 (Anzidei et Al., 2003). The aim is to estimate the active strain rate of the area. The network is distribuited across the Apennine regions of Umbria , Abruzzo, Marche and Lazio covering an area of $\sim$ 180x130 km. from the Tyrrenian to the Adriatic sea, across the main seismogenic faults. We show the GPS velocity field obtained from GPS data collected between 1999 and 2005, at the local scale, after the removal of the signal related to surficial gravitational movements due to large scale deep seated slides. This procedure permitted to obtain a signal which may be considered as consistent with the present tectonic regime. Data anlysis performed with Bernese 5.0 software, shows strain on the order of 10 ηstrain. Moreover the merger of geodetic data with geological and geomorphological informations, permitted to better define the kinematics of the gravitational displacements and the relationships between them and the tectonically – controlled modifications of the landscape.