



Surface and deep deformation of the Alps from geodetic and seismic anisotropy measurements

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We study crustal and mantle deformation of the great Alpine area as obtained by Global Position System (GPS) and seismic anisotropy measurements. We derive a new three-dimensional GPS velocity field, obtained from the analysis of thousands of continuous sites operating in the European plate. Using a multi-scale approach we estimate a continuous geodetic strain-rate field, which is compared with the tectonic deformation obtained from the analysis of earthquake focal mechanisms. Deformation of the mantle is inferred from the SKS splitting measurements collected during several experiments and available from different databases. The shear directions (or no-length-change directions) from the geodetic strain-rate field, are compared with the directions of a smoothed map of the SKS orientation over the study area. In this contribution, dynamics and interconnections between crust and mantle are showed and the geodynamic implications are discussed.