

Tectonic Strain distribution over Europe from EPN data

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In this contribution, we present strain-rate results from 298 permanent European GNSS stations (part of EUREF Permanent Network), operating since 1996 until 2018. The stations positions are computed with several geodetic software packages (mainly Bernese, but also GAMIT and GIPSY) and the combined positions are done with Bernese. Then we used CATREF to estimate multi-year positions and velocity solution. The available dataset comprises the velocity field extracted from the C2010 EPN solution. We calculated the strain-rate field using the open-source software STRAINTOOL (<https://github.com/DSOLab/StrainTool>) which uses the algorithm VISR (Velocity Interpolation for Strain Rate; Shen et al., 2015). The following products were obtained: Emax-Emin, rotational rates, 2nd invariant, shear strain rates and orientations of horizontal shear, dilatational strain rates etc. The vertical velocity component is ignored in this stage and other sources of deformation (GIA, hydrological, anthropogenic et al.) are not considered in the preliminary interpretation. We compare the results derived from different model setups (variable grid-size, distance from cell-centre, smoothing parameter etc.) and discuss the similarities and differences. Overall, our first results reproduce the gross features of tectonic deformation in Southern Europe, such as NE-SW extension across the Apennines (Italy), NNW-SSE compression across the Alboran Sea (western Mediterranean) and N-S extension in mainland Greece. Large areas of central and Northern Europe show small strain rates (less than 10 ns/yr; 2nd invariant of the tensor).

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