



A new approach of mapping a strain rate field by tensors for crustal deformations studies

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The representation of strain tensors is used in the same way since a long time to show the result of geodetic comparisons. The classical method uses four perpendicularly positioned vectors of different values. The reading of such a representation is quite difficult for non trained users, and it does not allow to show simultaneously the errors of determinations.

Our aim is to develop a new global tool, which permits to evaluate directly the lithospheric deformation in a region of interest from a velocity field at different epochs, obtained by space geodesy methods (like GPS). In order to facilitate the interpretation of these measurements for the geophysicists, a new kind of representation is used. All the data necessary (the normal and shear strain rate components, and their orientation) and their uncertainties are represented on the same map, using the most adequate cartographic methods. This tool should be useful to make the link between geodesists and geophysicists who want to give an interpretation of the crustal motion.

The first results will be presented, with tensor data directly obtained from a GPS velocity field. The emphasis will also be put on the interpolation methods which might be used to compute a velocity grid from a field of velocities observed on a sparse set of stations. Several cases of deformation (fault area, landslide area or tectonic plates) will be presented, and the advantages of our new tool for an easy geophysical interpretation will be shown.