

Interactive comment on “3D GPS velocity field and its implications on the present-day postorogenic deformation of the Western Alps and Pyrenees” by Hai Ninh Nguyen et al.

Anonymous Referee #3

Received and published: 20 July 2016

The manuscript presents a study of the three-dimensional GPS velocity field in the Western Alps and Pyrenees. The manuscript shows a considerable effort to evaluate the robustness of small signals and a careful analysis of the data and of the velocity estimation precision allowed by GPS time series.

The authors present a remarkable correlation plot between vertical velocities and site elevations (Figure 10). As suggested by the authors the Alps have significant relief at short spatial wavelengths, while the vertical velocities are probably more sensitive of a regional response of the lithosphere to loading variations (erosion, deglaciation, mantle dynamics). It would thus be interesting to plot vertical velocities versus some kind of filtered “low-pass” topographic elevations to see if the correlation still holds.

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The lack of an extensional strain rate signal in the Western Alps can also be explained by the absence of GPS stations on the Italian side, required to completely sample the deformation signal at the scale of the entire mountain belt. A couple of stations on the Italian sides were present in the velocity field used in Walpersdorf et al. (2015), possibly explaining the observed extensional signal.

Interactive comment on Solid Earth Discuss., doi:10.5194/se-2016-78, 2016.

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