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Interactive comment on "Present-day surface deformationof the Alpine Region inferred from geodetic techniques" *by* Laura Sánchez et al.

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This paper documents a data set, deformation model and strain field for the Alpine region, based on a homogeneously processed GPS/GNSS data set. The organization is good and clear, and most of the paper is fine as it is. There are a number of minor English errors, which I have marked in the annotated manuscript, and I will only note the more important points here. The analysis methods are sound and are well described, except for a few details about the LSC approach that need to be added.

The first missing point in the LSC description relates to the "common trend" (mentioned in the intro paragraph for section 5, but not otherwise defined). I suspect that in this case they are referring to the motion of the Eurasian plate, but this is not clear

because so far the presentation of the results has already been presented relative to the Eurasian plate. If the LSC was performed on motions relative to Eurasia, then this should be stated explicitly instead of bringing in a new and different term that is undefined. If they have removed some additional trend from the velocities relative to Eurasia before the LSC, then they need to describe that at some point in section 5.

The second missing point is that the covariance function is not described well. This could be added as a supplement, but I found the description in terms of the correlation distance d to be very brief. How do we know this distance is optimal?

My only other concern relates to the continuous model and how accurate it may be across the Po plain where there are no data. There is actually quite a strong difference in the horizontal deformation between the western Alps and the vicinity of Bologna, and in the absence of data the model puts essentially a linear gradient across the data gap. Obviously the authors can't do better than this without having a good geophysical model to more accurately fill in this gap, but I think they should add explicit caveats to the model strain rates across this area. The uncertainties they present do actually assume that the covariance function accurately describes the spatial correlation of the data equally across the whole region, and that might not be true. Therefore, the uncertainties across data gaps in areas of stronger deformation might be higher than reported if the geophysical signal here does not actually look like the covariance function.

All of the above points can be addressed with minor corrections, just a few sentences or less.

Please also note the supplement to this comment:
https://www.earth-syst-sci-data-discuss.net/essd-2018-19/essd-2018-19-RC1-supplement.pdf

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