

Interactive comment on “Subsidence activity maps derived from DInSAR data: Orihuela case study” by M. P. Sanabria et al.

Anonymous Referee #1

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General comments:

This paper shows a good application of Persistent Scatterer SAR Interferometry to the multi-temporal (1995-2005 and 2004-2008) study of ground subsidence due to aquifer over-exploitation in Orihuela City (SE Spain), using two sets of PSI data and some geothematic layers. In particular, the aim of the study is to create subsidence activity maps (associated with an assessment of the spatial uncertainty and a confidence degree on the interpolation) interpolating the scattered information retrieved by SPN analysis. The obtained results have been firstly analyzed at basin scale as support for land motion mapping and to identify those conditioning factors to be taken into account to perform interpolations. At more local interpolated data have been exploited for the characterization of ground motion, i.e., for the assessment of buildings service limit C2000

state. Particular attention has been devoted to historical buildings. In the referee's point of view, the combination of geotechnical approaches and satellite InSAR measurement represents a quite new post-processing analysis when dealing with PSI, a technique already consolidated and widely accepted. The methodology proposed is novel, the work is shown with a valid scientific method, is within the scope of NHESS and a good addition to the literature. I accept this work with minor revision (see comments below).

Specific comments:

1- Page 5368, line 11: I suppose PS means Permanent Scatterers, but here a complete spelling is needed since it is the first appearance.

2- Page 5368, line 18: what dose “normalized” mean? Do you mean that the LOS displacements have been projected along the vertical direction?

3- Page 5369, line2: I am a little bit confused by “unsampled pixel (PS)”. Did you use two sets of known points (PS) to extend the information to unmeasured location (unsampled pixel), is it right? If I am correct they cannot coincide. Please clarify.

4- Page 5371, line 6: Specify acquisition geometries.

5- Page 5371, line 20: Many PS points show positive velocities: within the basin it means ground uplift (recharge), but there are some PS points with positive velocities also along the southern mountain range. How the authors explain this?

6- Page 5372, line 7: I would suggest the authors to briefly describe (without going into detail) how the R software employed in the spatial analysis works to distinguish different components.

7- Page 5375, line 8: I couldn't understand if the subsidence activity maps have been generated interpolating the LOS velocity or its projected vertical component. If LOS velocity has been used, why not considering the elevation angle of ERS and ENVISAT satellites? I agree velocity doesn't change very much (the increment variation may be around 10%), but since it is easy to do, it may lead to more representative calculation

of differential settlements and angular distortions

8- Page 5379, line 21: paragraph 8 is currently an exhaustive summary of the performed work and of the obtained results. Discussions are weak. I would suggest to add some more words about potentials, limits, advantages, drawbacks and usefulness of the proposed approach.

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