

Review of the revised manuscript “Monitoring surface deformation of deep salt mining in Vauvert (France), combining InSAR and levelling data for multi-sources inversion” by Furst et al. for publication in Solid Earth.

The article focuses on the characterization and the modelling of the subsidence deformation due to the exploitation of underground salt in southern France. The deformation field is estimated from the combination of three geodetic techniques: InSAR, levelling and continuous GPS. After describing the geological and industrial contexts, the authors describe the methodology they developed to constrain the 3D deformation field from InSAR and levelling. The GPS measurements being not compatible in time, they contribute as control points and to qualify the models. The final preferred model is composed by 21 dislocation planes showing volume variations beneath the active wells and deeper salt flows coherent with the observed subsidence and horizontal displacements according to the uncertainties.

The authors answered precisely and rigorously to both previous reviews. They correctly took into account the suggestions, comments and requested corrections.

Then, in my opinion, this article is acceptable for publication in Solid Earth after taking in consideration the following minor corrections, which are for the major part due to typing errors or unfortunate oversights.

1- In the introduction, in the section describing the combination methodologies of the geodetic measurements (lines 50-74), it would be useful to precise by a short sentence that they generally assume a constant deformation rate over the observed period, as the authors assume at line 187.

2- Line 79: there is a forgotten “)” after velocities.

3- Line 117: double “()” for the citation.

4- Fig. 1 caption: in my view, a caption is sufficient by itself to read a figure without to refer to the text. So, a description of D1 and D2, and the derrick symbols with their associated numbers has to be added here.

5- Line 136: it seems to me that “(Figure 2a)” is not at the good place.

6- Line 157-159: The “steady” vertical velocity after 2003 seems, in figure 3b, more than 21mm/yr as assumed by the authors, especially after 2015. Any comment?

7- Fig. 2: the red line A-B is not described in the caption.

8- Line 174: I don’t understand what means “optimized” concerning the time and the perpendicular baseline for the choice of the master images. Could you be more precise?

9- Fig. 4 caption: there are repetitions and missing: “Mean velocity in LOS direction in a) ascending and b) descending interferograms over the area of interest (~~black polygon is KemOne properties boundary~~) and their associated uncertainties c) and d) respectively. Ascending geometry is characterized by a look angle of N103.96 and an incidence angle of 32.93°. Descending geometry is defined by a look angle of N256.01 and an incidence angle of 36.98°. The polygons represent the extent of Vauvert and Beauvoisin cities (blue polygons) and the KemOne company area (black polygon)(see Fig. 2b).

10- Line 213: “and” rather than “or”? Geodetic measurements

11- Line 239: the second θ is “dsc” not “asc”.

12- Fig. 6 caption: insert InSAR in “ascending and descending geometries”.

13- Line 278: the information done in the sentence “At the first order, ... North-South axis” is a useless repetition of the sentence in line 238-239.

14- Line 308-309, “The incorporation of levelling data....from dual geometry InSAR”.

First: is it better to write “dual InSAR geometry”?

Second: It is not easy to estimate quantitatively the amplitude of the “refining”. Do you have an idea about? I expected to see a trace or a footprint of the levelling profile on the map of Fig. 7c. This absence, is it due to the kriging or to the good consistency of both measurements, or something else?

15- Lines 376-377: “modelled” and “modeled”...

16- Line 382: to be completed?

17- Line 415: the sentence “The change in volume ... produced yearly” is a needless repetition.

18- Line 443: “at a value between 30.9 and 38.6 cm at $2\text{-}\sigma$ ” is for which dislocation parameter? It is not clear.

19- Line 458: Did the authors investigate the possibility of the presence of the classical trade-off between displacements on the dislocation planes and their depth, especially for the opening parameter?

20- Line 484: “to select” rather than “to selected”

21- Line 528: Precise that “doublets” refers to the wells not to seismic events. This term of “doublet” can be confusing for a seismologist..

22- Line 539: spatially dense measurements?

23- Line 627: the Hammond et al.’s reference is incomplete.