

# ***Interactive comment on “Evolution of surface deformation related to salt extraction-caused sinkholes in Solotvyno (Ukraine) revealed by Sentinel-1 radar interferometry” by Eszter Szűcs et al.***

## **Anonymous Referee #2**

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General comments: This manuscript applied InSAR to detect ground deformation related to salt extraction-caused sinkholes in Solotvyno (Ukraine). Both ascending and descending datasets from Sentinel-1 satellite were used to decompose horizontal and vertical displacement. Results found that the maximum LOS deformation is 5 cm/yr and the vertical deformation is much more dominant in the area. However, the aim of this paper is not completely clear: are the authors willing to prove the usefulness of InSAR applied to sinkhole deformation (focus on the methodology) or are they interested on the ground deformations detected on the salt mines (focus on the case studies)?

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Specific comments: 1. The authors talked a lot about geological settings in Section 2 “Geographical and geological background”, but it looks not related to your discussions later in the paper. The same problem as in Section 3. Could you relate your deformation results to the geological settings and mining activities? Maybe you can add a section in discussion to talk about the relationship between deformation and geological setting/ mining activities. 2. In section 4 “Materials and methods”, the first paragraph (line 155-175) is not related to this section, you have to focus on your SAR datasets and what method you developed/used to process your SAR data. My suggestion is to simplify your section 2 and discuss more about your methodology. Describe more about what software you used to process Sentinel-1 data, how do you deal with coherent pixel selection, or maybe how to mitigate atmospheric delay. 3. The description of decomposition method in Section 5.2 should move to the section “Methods”. And in this section, you just need to discuss the decomposition results. 4. The equation of decomposition is wrong, the heading angle is missing. please refer to (Fuhrmann & Garthwaite, 2019). 5. I think your discussion is not enough, could you please talk about how the deformation results relate to the geological settings you described in Section 2.

Technical corrections: 1. Line 307, please check the citation format (Velasco et al., 2017) . And some of the same problems across the whole manuscript. 2. Line 221, Small Baseline Subset, SBAS -> Small Baseline Subset (SBAS) 3. Line 203, 1’ resolution SRTM, is it 1 arc second?

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