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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Assessments of land subsidence along Rizhao-Lankao High-speed Railway at Heze, China between 2015 and 2019 with Sentinel-1 data" *by* Chuanguang Zhu et al.

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Dear Mehdi Darvishi and Editors,

First, I'm very sorry for my late reply as I'm not familiar with the procedure of this journal. We gratefully thank you for your constructive remarks and useful suggestion, which has enable us to improve the manuscript. Our responses and revisions are as follows:

1-In the first paragraph of page 2, the following corrections should be performed: time-consuming" and "advanced methods".

Response: Thanks a lot. The manuscript has been revised carefully according to the comments.

2-Which strategy has been taken to mitigate the atmospheric artifacts in the ifgs?

Response: Thanks a lot. Generally, atmospheric signal is assumed uncorrelated in time and correlated in space. Based on the assumption, atmospheric artifacts can be separated from deformation using a combination of temporal and spatial filtering. In fact, the vertical stratification component of atmospheric effect shows some degree of seasonal and topographic correlation. Some algorithms have been proposed to estimate this component using DEM and numerical weather model. However, the vertical component of atmospheric effect is ignored in this paper as the study area has a relatively flat landform with altitude varying from 37 to 68 m.

3-As the multi-looking and spectral filtering have not been applied, how did you get a coarse spacing of 50m for the final result?

Response: Thanks a lot. In fact, all the results, shown in all figures except Fig. 4, are with an original spatial resolution (i.e., single-look). We just coarse the results in Sect. 4.2 in order to identify the common MPs to assess the consistency and precision (shown in Fig. 4) of InSAR results. Each MP has its own longitude and latitude. The script 'llh2local.m' in StaMPS software can convert the longitude and latitude to local coordinate. According the local coordinate, we can resample the results from S1-40 and S1-142 with a spacing of 50 m. The displacement rates will be averaged if multiple MPs are located in the same grid.

4-The function of adaptive filter along with the selected parameters should be more elaborated for readers.

Response: Thanks a lot. Relevant information (shown below) has been supplemented in Sect .3 (page 6, line 8-19), and the corresponding supplements is attached.

Please also note the supplement to this comment:
https://nhess.copernicus.org/preprints/nhess-2020-176/nhess-2020-176-AC1-supplement.pdf

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