

Interactive comment on “Morphology of an arid landscape utilising synthetic-aperture radar (SAR) and differential interferometric SAR (DInSAR), southern Riyadh, Central Arabia” by Mohamed Daoudi et al.

Anonymous Referee #2

Received and published: 21 January 2021

With reference to a Central Arabia landscape, the submitted manuscript would seek to achieve two goals, that are the SAR "ability" to detect changes in "morphology" and to assess some geohazards related to fault-activity and karst-dissolution. However, it is not well written and is rather confusing. It is not even clear the state of knowledge from which the authors started in their research and even what their actual findings are. Among the various primary and secondary aims that are stated in the course of the narrative, it would seem that perhaps that the one actually most relevant is to test "the ability of recent techniques and methodology to create short-period monitoring and

C1

analyses via available SAR and DInSAR images" (lines 93-94; see also lines 260-262).

The poor structure of the manuscript is immediately evident from the first sentences of "1 Introduction", where instead of explaining the problem of general interest addressed, the authors first describe the study area. Please editing it. Furthermore, in 1 Introduction, the state of knowledge of the problems faced must be clearly explained.

If Fig. 3 "shows the primary results obtained from the pair of images obtained on 26 May 2004 and 31 Jan. 2005" (lines 124-125), why is it mentioned in section 2 (Data and methods)?

The whole subsection 3.1 does not seem a result of the use of SAR methods, rather a part of the state of knowledge. They must be rewritten.

I find that even in subsection 3.2 there is little clarity. It is not clear what are the previous knowledge and what are the findings of the research conducted by the authors. Among the various ambiguous sentences I point out the following: "The maximum height of elevation is approximately 1,000 m in the west, and the lowest altitude is approximately 400 m in the east, indicating a maximum 600 m of downthrown displacement and depression. Profiles 4 and 5, plotted E-W along the Awsat and Nisah valleys reveal eastward tilting and consequent capturing of the hydrologic system by the last tectonic event in the Central Arabian graben system (Fig. 8)" (lines 177-180). Do the altitudes and differences in height result from the "Amplitude and intensity images"? Were they not known before the authors' study? Again, are the "reveal eastward tilting and consequent capturing of the hydrologic system" a result of the submitted manuscript? Or are they the result of published studies?

In section 3.3 some repetitions are apparent. I am referring to good-poor coherences and their interpretations (lines 185-192). Please make it more understandable.

There must be consequentiality among state of knowledge and related issues to be faced, methodology, results, and everything must meet in the final discussion. This,

C2

unluckily, does not appear in the submitted manuscript. Much of section 4 Discussion is a review of the uses of SAR methods, with no connection to the investigations carried out (lines 224-259). After, the authors stated again that their "study tests the ability of the SAR and DInSAR imageries and applies them on this arid region for the reported karstification (e.g. Bamoussa et al., 2014) and recent activities of the Sahba fault and valley ..." (lines 260-265). Please, where are the results of these tests shown? Even the three factors stated in the final part of 4 Discussion (lines 260-270) are not related to what is stated in 3 Results. For example, where are the earthquake-activities tests described? Does the "reactivation of the fault" result from the use made of "short-period monitoring and analyses via available SAR and DInSAR images"?

The manuscript must be profoundly amended to be eligible for publication.

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss.,
<https://doi.org/10.5194/gi-2020-32>, 2020.