Interactive comment on “Identification of high risk zones for geological origin hazards using PALSAR-2 remote sensing data: Kelantan river basin, Peninsular Malaysia” by A. Beiranvand Pour and M. Hashim

Anonymous Referee #2

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Identification of high-risk zones for geological origin hazards using PALSAR-2 remote sensing data: Kelantan river basin, Peninsular, Malaysia

The authors conducted a study using SAR data to map high-risk zones in a river basin in Malaysia. The information was compiled by visual interpretation.

General comments

Large parts of the manuscript have already been published in a conference paper from which the authors copied text word by word. Even the figures and maps are taken from this publication: [1] A. Beiranvand Pour and M. Hashim, “Application of PALSAR-2 remote sensing data for landslide hazard mapping in Kelantan river basin, Peninsular Malaysia,” Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., vol. XLI-B8, pp. 413-416, 2016. The authors should at least take the effort to re-formulate the text. In addition it should be clear what distinguishes the new manuscript from the already published work (novelty aspect).

In general the manuscript needs some re-structuring to provide a logical information flow. Some redundant text should be removed (repetitive). The references used are overly outdated. In addition the manuscript needs English editing (use of article, grammar). See also detailed comments.

The study focused on landslides, which should be mentioned in the title in order to point out the content of the paper. This is also valid for the description of risk zoning within the text.


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Scientific questions/issues (Specific Comments)

The description of the study area (lines 48-50) belongs to section 2 and not into the introduction.

What do the authors mean by "advanced remote sensing technology" (Line 63)? Please explain. It should be pointed out that the main information extraction was performed by visual interpretation.

The description of the ALOS systems could be shortened. E.g. remove details on ALOS-1 since the study only uses ALOS-2.


Line 108-109 What do the authors mean by "largely lacking"? Does it mean there are no maps or only for part of the Kelantan river basin? Or are maps existing but not up-to-date?

From the text it is not clear what the objective (iii) Lines 115-116 is supposed to deliver. Please explain the purpose of objective (iii).

An overview on the manuscript is missing and should be inserted before Section 2.

Line 159-212 Is it really relevant to describe the entire PALSAR-2 system? Is the identification of the best imaging mode for the study purpose part of the study (Lines 172-173)? It is mentioned but not explicitly researched. What is the reasoning for the selected modes? The authors should consider to shorten these paragraphs and relate to the necessary information belonging to the study. The acquisition dates of the SAR data are missing and form a relevant information in the interpretation process, in particular for the link to the collected ground truth.

Remove "for comprehensive analysis of major ... of Kelantan." (Lines 178-179) This has been said before. Repetitive.

The description of precipitation and soil moisture and their influence on the data should be contained in the background information (introduction) and not in the description of the material section. Re-structure.

It would be useful to provide a kind of flowchart at the beginning of Section 4 to provide an overview on the image processing performed to the reader.

the most cited document, which explains texture and feature detection. If the authors like to cite all the others too, it should have a reason.

Lines 291-296 The collected ground truth should be provided in a table or map to provide an overview on the content and distribution of the collected information.

Throughout the document there is no discussion on the choice of RGB assignments of the different channels. The authors should point out if they refer to standard channel assignments as used in geology or if the assignments were particularly applied for this study only. If the latter is the case it should be reasoned.

The information contained in lines 373-378 belongs to the background information (introduction). Similarly the text of lines 391 - 395 should be moved to the introduction.

It is not clear how the analysis of the field data has been done (Lines 480-483). Please clarify. Apparently major analysis efforts were done by visual interpretation. Looking at the application and the data that went into the analysis process it would be interesting to know why the authors did not consider using a GIS analysis and tools to provide rules for computer-supported analysis.

Line 505-507 What are “advanced remote sensing satellite data”?

Line 517-520 What is a “total solution” how do the results of this study relate to flood disaster management? The manuscript does not contain any research on flood management nor tools to do so. The work provides information from SAR data that could feed into a GIS.

Technical corrections
Line 61 "... between active faults, ...
Line 62 "Therefore, the delineation of faults ...
Line 63 "... in any region is a necessity to ...

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Lines 70-72 "ALOS-2 contains a Phased Array type L-band Synthetic Aperture Radar-2 (PALSAR-2) using microwaves to maximize its ability compared to ALOS-1, which contained three sensors, i.e. two optical and one microwave device."

Line 74 "... PALSAR-2 has the ability to ... due to its relatively long wavelength (..."

Lines 78-79 Repetition. Delete sentence.

Line 80 Complicated sentence: "Not only ... well." Re-phrase.

Line 86 "... increase in the amount of ...
Line 92 "To date, only a few studies ...

Line 96 The word ‘dire’ doesn’t seem to be appropriate in this context. Suggestion: “There is an urgent need to apply ...

Line 106 "A recent challenge ...

Line 111-112 Remove explanation of PALSAR-2 "ALOS-2 Phased Array type L-band Synthetic Aperture Radar-2". The abbreviation has been defined in the beginning and should be used throughout the text. Remove "recently launched" (already explained in the beginning). Remove "remote sensing".

Line 120 "... composed of a central ... of the Southeast Asian ...
Line 121 "... is located in the north-eastern ...

Line 124 "The Kelantan river ...

Line 125 "... of a flat slope ... in the northern ...
Line 137 "... Pahang states and Thailand (Fig. 2)."

Line 148 "... of Kelantan is divided into four ...

Lines 190-193 "The HV channel ..." Avoid repetition. The information on available polarizations could be summarized in one sentence.

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Particularly the HV channel ... modes increases the amount ...

Therefore, the HV polarization ...

This flexibility makes convolution one of the most useful tools in image processing. - only for the purpose of feature extraction, in this case lineaments!

Is this valid for all remote sensing images or does it relate to SAR?

What are 'systematic image processing techniques'?

"... images reduces the detectability ..."

"In this study, a 3x3 neighborhood ..."

"The Image Add Back used was 60%.

"Edge enhancing filters highlight any ..."

"... in counterclockwise direction." "An Image Add Back value of 60% was used."

Please explain "systematic remote sensing techniques". It is not clear which images (polarizations) have been entered into the red, green and blue channels, re-
spectively.

"The image acquired in ScanSAR mode was used ... structures. It shows mega-geomorphology ..."

"Figure 3 shows an RGB ... for the ScanSAR median filtered image."

"... shows a ScanSAR ... by a general topography ..."

The range '500-100 m' should be mentioned as "100-500 m". What is the meaning of differentiating 100-500 m and < 1000 m? Similarly Line 329 (range 50-500 m). This overlaps with 100-500 m. Please explain the categories.

"Figure 6 shows the fine mode ..."

"... the HH polarization ...

"... an image map containing important ...

"Hence, the antenna did not receive a returned radar signal."

Re-phrase: "Soil moisture/wetness information is best obtained from L-band radar because of its ground penetrating capability."

"... distributed in the northern ...

"... observable in the central ...

"Hence the combination of ...

Is this really a merged image or a colour composite?

"... with the geological map ...

"... images of the fine mode observations, ...

"... shows a structural ..."
"The rectangular pattern..."