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Interactive comment

Interactive comment on "Deriving slope movements for an imminent landslide along the Jinsha river" *by* Wentao Yang et al.

Wentao Yang et al.

yang_wentao@bjfu.edu.cn

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Point to point responses to Anonymous Referee #2

1. For landslide, the paper lacks the basic description of landslide, such as scale, slope, sliding material, etc. It is suggested to add the above contents.

Response: The area of this slope with displacement >3m is 715,577 m2 (line 163). The slope of this landslide is mentioned in the "2.1 Study area" (lines 69-70): "This part of the slope has a percent slope of 45% and an aspect of the southeast, with azimuth between 112.5° and 157.5° (Figure 1c)". Because we did not carry out field reconnaissance yet, we little information about the material of this landslide. However, we mentioned some of its lithology also in the "2.1 Study area":

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Discussion paper

“. . . The slope is located on the right bank of the Jinsha River. Similar to the Baige landslide, the geomorphology of this section of the Jinsha River is at the bottom of V-shaped valley. . . this area is tectonically active and active faults run through this slope from north to south. West of the faults are Upper Paleozoic strata, and east is Mesoproterozoic metamorphic rocks. Cracks and fissures on the slope is visible from the 15 m resolution pan-sharpened false colour Landsat 7 image acquired in 2001 (Figure 1b). These cracks and fissures may be relics of historic earthquakes or precipitations . . .”

2. For the data, we know that there are 13 bands in sentinel 2 image, the article does not mention which band was used. It is recommended to supplement the band number and outline the reason.

Response: We added a paragraph in the “2.2 The COSI-Corr method” part (lines 73-79):

“We mainly relied on Sentinel-2 optical images to derive slope movement. The European Space Agency’s Sentinel-2 mission has two twine satellites in orbit, with a revisit time of fewer than 5 days. The Sentinel-2 optical imagery has 12 optical bands with wavelength ranging from 440nm to 2200nm. There are 4 bands with a spatial resolution of 10m: blue, green, red and near-infrared bands. To derive slope movement, we used the red band because its wavelength is longer than other visible bands and is less influenced by the atmosphere. Compared to the near-infrared, this band is less sensitive to vegetation and is more reliable (Yang et al. 2019). This study used the Level-1C product, which is already orthorectified before distribution (Gascon et al. 2017).”

3. For the stable area, first of all, the attribute of the stable area should be explained, which is bedrock or stable accumulation or others. When correcting errors with a stable area, the noise reduction process needs to be described in detail.

Response: The major criterion to select a stable zone is that it is stable. In this case, “The stable zone in this work was selected on the upper part of the landslide (red rectangular in Fig 1b and 1c). We select this area because this stable zone is on the same slope as the landslide, which can minimize the influence of illumination and errors during orthorectification" (lines 104-106). If it is not stable, then there will be ubiquitous movement throughout the study area. As this is not the case, so we think this selected stable zone is valid in this work.

We also added a few sentences to describe how to use estimated errors in the stable zone to reduce noise in the results (lines 102-104): "In addition, misalignment between images can be estimated by selecting a stable zone (Bontemps et al. 2018; Lacroix et al. 2018; Yang et al. 2019). Mean displacements estimated within the stable zone will be used to correct image shifts."

4. For the illustration, figure 3 lacks the picture that matches the description, and Figure 4 lacks the introduction of the right half.

Response: Thanks for pointing out these mistakes, which we corrected. Please refer to the revised manuscript.

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