

## ***Interactive comment on “Brief Communication: Use of multicopter drone optical images for landslide mapping and characterization” by Guglielmo Rossi et al.***

**F. Marinello (Referee)**

francesco.marinello@unipd.it

Received and published: 6 May 2017

Communication: Use of multicopter drone optical images for landslide mapping and characterization

The paper discusses a new UAV and its application for landslide mapping through application of SFM techniques.

Main comment: the topic of the paper is overall interesting however the focus is not clear. Specifically it is not clear if the authors wants to present a new UAV or a new approach, as claimed by the title. Additionally the experimental part seems not sufficient to adequately support with a scientific rigor the expected results

C1

3 Material and methods 3.1 The multicopter drone: this paragraph looks like an advertisement of the new drone, however it is not clear what is really new in a drone, considered that there are hundreds drone (mainly helicopters) with high payloads and high autonomy. If the authors wants to stress in the paper the merits of the drone, this should be made clear in the title and in the abstract and more material should be reported to support what is new in the patented UAV. Otherwise this paragraph can be reduced to a couple of lines, since a drone is just a platform to bring cameras over the landslide. If the merit of the new approach is based on the goodness of the drone, than at least a comparison with a “standard drone” (and possibly further experiments) should be reported.

Also, a 10kg payload is claimed, but the actual weight of the commercial camera + gimbal probably is no larger than 500g. Therefore the author should state how such large payload can be of help, compared to an UAV with a lower payload.

3.2 Digital photogrammetric surveys: it seems that Ground Control Points have been used for lateral calibration and wide vertical calibration, but it is not clear how fine vertical calibration (allowing reconstruction of soil roughness) has been done. Additionally it is not clear how different 3D reconstruction in different dates has been done considering that just 1 cm vertical misalignment can cause an error of several tens or hundreds cubic meters in 0.02 km<sup>2</sup> area. Alignment is not a trivial issue, since soil naturally evolves in a no homogeneous way due to different local moistures, vegetation, etc.

Also, since the paper focuses on the use of a drone for landslide characterization, the advantage with respect to a 3D reconstruction achieved using photographs taken just at ground level would have been useful. Finally a 30 minutes autonomy is claimed, but it is not clear the duration of the flight in the experimental area (only 40 minutes is reported, but including flight planning and GCPs acquisition with GPS).

Post processing time (for 3D optimal reconstruction, calibration and alignment) is the most important contribution to evaluate overall time. Authors should discuss this point.

C2

6. Conclusions: Authors say that “The drone survey has proven to be an easier and more cost- and time- effective approach with respect 5 to other techniques.”. Actually no evidence and no comparative experiments have been reported to allow time of cost effectiveness.

Minor comments: correct “ .. ” in the abstract increase visibility of scales in Figure 4.

Please also note the supplement to this comment:

<http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2017-46/nhess-2017-46-RC2-supplement.pdf>

---

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., doi:10.5194/nhess-2017-46, 2017.

C3