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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Brief communication: Remotely piloted aircraft systems for rapid emergency response: road exposure to rockfall in Villanova di Accumoli (Central Italy)" *by* Michele Santangelo et al.

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This work describes how Remotely Piloted Aircraft Systems can be used for the analysis of rockfall hazard, mainly through the reconstruction of a DTM to use for rockfall propagation analysis. The technical details about data acquisition and processing to get the DTM are described as well as the propagation analysis using the program STONE, and the use of the results for assessing the exposure of the roadway to potential rockfalls. The case study presents interest as far as the processing of the RPAS to get the DTM. Propagation analysis using an already developed software in itself is

more trivial, however the weight here is mostly given to the interpretation of the results for the design of protection measures and hazard assessment for the specific case-study. In my opinion, there are some issues which require further clarification and/or refinement. I see the following major issues:

- In the way that the topic is introduced, even from the title, there is a strong focus on the use of RPAS for the emergency response, which is thought to last some hours or few days after an event. However, it not clear how this work provides additional information for improving the emergency management, compared to common pre-disaster or post-disaster exposure assessment. In practical terms, for such an event, 15 days of road closure needed for the analysis is substantial time, especially if no alternative roads exist.

- There is no mention about the rockfall magnitude and its effect on the run out analysis. If validation of the terrain parameters was made just for the co-seismic rockfall volumes, it is not clear how the road can be affected by larger post-seismic events.

- A process is presented in order to improve a DTM in the vegetated areas, where elevation points are missing, which is based on the integration of GNSS-RTK data points. Still the density of those points is not sufficient to provide a good DTM, as seen in Figure 2. The smoothening still seems unrealistic. Some further analysis is required to provide the order of magnitude of the errors of the DTM, and in what extent it can affect the trajectories and the rockfall run-out results, so as to justify its use for risk management.

- Run-out model results require further validation. As commented in the text, most deposited blocks in Figure 3B seem to be on cells where just 1 trajectory was found out of the more than hundred total trajectories. There has to be some further justification on the credibility of the results, so as to be able to support post disaster decision taking.

- Figures 1 and 3 could be larger, and sometime legends are not illegible.

Please find some specific comments in the attached .pdf.

With kind regards

Please also note the supplement to this comment:
https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2018-177/nhess-2018-177-RC2-supplement.pdf

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