Natural Hazards
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Sciences

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Discussions

Interactive comment on "Numerical investigation on the kinetic characteristics of the Yigong landslide in Tibet, China" *by* Zili Dai et al.

Anonymous Referee #1

Received and published: 16 November 2020

The writer has some concern about this paper. It seems a numerical exercise, the application of a numerical code. A question arise: which is the novelty of this numerical code when compared with other SPH numerical codes? Moreover, this code does not simulate the bed-entrainment as that of Cuomo et al. (2016). There also other deficiencies: what about the pre-event bathymetry? What about the Digital Elevation Model? Model results depends also on the data (LiDAR or photogrammetric points) by which the Digital Elevation Model is built (LiDAR, photogrammetry, see Degetto et al. 2015), the interpolation technique (Boreggio et al., 2018) and grid size (Stolz and Huggel (2008)). Information about the development of the phenomenon and post-event bathymetry are introduced without any explanations:

1) Who estimated the peak and average velocity of this rapid landslide? Which sensor

was used for measuring them? Moreover, the peak and the average values of the velocity, 100 m/s and 40 m/s respectively, seem physically not acceptable. 2) . How the post-event topography was measured?

Moreover, the reliability of a model depends on the its capability of reproducing the observed deposition pattern. The authors should compare the observed and simulated deposition depths not only the deposition area (Gregoretti et al., 2019).

Finally, some other general comments: it is strange that no erosion was observed along the flow path and that this rapid-landslide did not transform into a (muddy?) debris flow?

Other specific comments are as follows:

Lines 17-18 "This approach can provide a new way to predict hazardous areas and estimate the hazard intensity of rapid landslides." This sentence is misleading: models are used to simulate scenarios and building hazard map. Therefore, where is the novelty of this approach?

Line 216 "The simulated runout distance is about 8,500 m, which can also match the measured result very well." This sentence is useless when observed and simulate deposition pattern are compared (see figure 16) The word "accumulation" is not appropriate: use the term deposition

REFERENCES

Boreggio, M., Bernard, M. Gregoretti C. (2018) Evaluating the influence of gridding techniques for Digital Elevation Models generation on the debris flow routing modelling: A case study from Rovina di Cancia basin (North-eastern Italian Alps). Frontier in Earth Sciences, doi: 10.3389/feart.2018.00089

Degetto M, Gregoretti, C., Bernard M. (2015) Comparative analysis of the differences between using LiDAR and contour-based DEMs for hydrological modeling of runoff generating debris flows in the Dolomites. Frontiers in Earth Sciences 3:21. doi: 10.3389/feart.2015.00021.

Gregoretti, C., Stancanelli, L., Bernard, M., Degetto, M., Boreggio, M., Lanzoni, S. (2019) Relevance of erosion processes when modelling in-channel gravel debris ïňĆows for eïňČcient hazard assessment. Journal of Hydrology, 569, 575-591; doi10.1016/j.jhydrol.2018.10.001

Stolz, A., Huggel, C. 2008. Debris flows in the Swiss National Park: the influence of different flow models and varying DEM grid size on modeling results. Landslide, 5, 311-319

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2020-289, 2020.