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Natural Hazards and Earth System Sciences
Discussions



# *Interactive comment on* "Three-dimensional numerical simulation of mud flow from a tailings dam failure across complex terrain" *by* Dayu Yu et al.

**Anonymous Referee #2**

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Title: Three-dimensional numerical simulation of mud flow from a tailings dam failure across complex terrain Authors: Dayu Yu, Liyu Tang, and Chongcheng Chen

General comments: The submitted manuscript describes a 3D method to model a mud flow event from a dam failure using OpenFOAM source code. The authors model the flow using the Bingham-Papanastasiou constitutive law and analyse the model performance simulating the obtained results by means of an experimental verification. After that, the authors use the model to simulate two scenarios of tailings dam failures. Simulation results obtained are poorly analysed and describe only in qualitatively way, while



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a quantitative analysis should be provided. The presented paper could provide a good addition to the literature, showing a good fit with the journal main topics, but only after accurate revisions.

Main suggestions are: The figures are generally not clear and too small relating to the information contained. There is a poorly coherence with the text content, especially in figure 2 and 3. A quantitative analysis of the simulation results is missing in the experimental verification and in both dam failures simulations. Historical results are citated to confirm the goodness of the simulation, but no field data or observations are presented to validate the goodness of the modelling procedure. It is not clear the cell size used in the terrain model and which DEM is used for the A'xi tailing dam event (pre or post event). The authors attributed some rheologic parameters to the modelled flows without performing a back analysis to define such parameters and to justify their choice. It would be better to specify in the paper that this aspect has to be take into account in the simulation of a real case.

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