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Geoscientific Model Development Discussions

Interactive comment on "r.avaflow v1, an advanced open source computational framework for the propagation and interaction of two-phase mass flows" *by* Martin Mergili et al.

Anonymous Referee #1

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The paper presents a complex dynamic model for simulation of interacting solid and fluid mixture flows implemented in open source GRASS GIS. It represents an innovative, valuable contribution to the field of mass flows modeling. As authors point out in the discussion, the model requires number of parameters which are not readily available and validation of the model for real-world situation will require a complex experimental set up. Therefore, the model now serves mostly as a valuable theoretical tool to improve understanding of the complex mass flow processes. Implementation in a widely used open source GIS will provide opportunities for collaborations in validation and improvement of the model.

The paper is well written, although in general it is easier to read papers which start

with theory and mathematical foundations of the model followed by the implementation but in this case the reverse structure is acceptable. The core of the model is apparently described by Pudasaini (2012) but it would be useful to accurately specify the topography-following coordinates, as the description on p. 8 l. 220-224 is rather vague.

A small formal issue- in the Figure 12 the relation between the colors in the image and the legends is not clear - it either needs to be explained in the caption (e.g., where is the blue and purple in the image?) If the legend is designed for the animation it would be better to have a different legend for the static image to make the image easier to interpret.

Just a final note that given that the module produces time series of raster maps - the series can be registered with GRASS GIS temporal framework and visualize easily as a dynamic surface in addition to the standard 2D animation.

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