Comment on gmd-2021-277
Anonymous Referee #1

Referee comment on "Flow-Py v1.0: a customizable, open-source simulation tool to estimate runout and intensity of gravitational mass flows" by Christopher J. L. D'Amboise et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2021-277-RC1, 2021

The paper is an essential contribution to modeling GMFs, especially snow avalanches. During the last couple of decades, most work has been focused on physical models, and most work has been published as proprietary software with high fees to use. These models are still widely used today, but the proprietary software limits scientific development. The Flow-Py tool is a new and improved model built upon existing literature/models. Finally, seeing an open-source model published will be a significant step forward where other researchers can implement and improve the model.

Both the paper and the code are well written. I'm able to run the code without any problems. One note: several times, it's stated that the code is computationally easy to run. My impression after running the code is that it is relatively computationally heavy to run. The authors do not compare the processing time to similar physical or data-based models, but this is subjective. I'm not sure if, i.e., the RAMMS software for the same 100 km² extent will take more than the roughly 4 hours mentioned to run the AOI.

How the flux controls the spreading and partly Z is well explained in Figures 3 and 4. In Figure 5, there is an example where the GMF has to overcome a dam in the slope. It would be nice to see an example where the kinetic energy isn't high enough to overcome the dam, and the total runout doesn't reach the given threshold travel angle.

Line 35-36: What is the order of citations? By year (old to new)? Alphabetical? It's not consistent throughout the paper.

Minor spelling details:
Line 226: "cells"
Line 227: Fix degree symbol
Line 285: No capital letter in "output"
Page 24, footnotes: "thee"