

Introduction

In the present study, novel insights are presented that facilitate a comparative analysis of erosion and deposition processes in lahars evolution. Actually, flow thickness has been employed as a determinant factor. It might be instructive—though not imperative—to scrutinize the influence on dynamic pressure, particularly if a notable alteration is discerned. The manuscript is methodically robust and coherently structured. Both the objectives and the conclusions drawn are lucid and of significant import.

Specific points

- The abstract cogently delineates the content of the manuscript. Additionally, it references subsequent studies that both corroborate and expand upon the subject matter.
- The conclusions drawn are both transparent and congruent with the empirical data elucidated within the text. The assumptions and constraints of the model are appropriately outlined, thereby enabling the derivation of specific inferences concerning the subject at hand.
- Given that the code is accessible to the reader, the reproducibility of the obtained results is verifiable.
- The title aptly encapsulates the essence of the manuscript's content.
- The prose is articulate, and the utilization of equations and figures is both pertinent and accurate.
- Notwithstanding these strengths, certain technical modifications are requisite prior to the paper's publication.

Technical comments

1. Missing reference (citation in bibliography)
 - a. Line 44 (IEA et al, 2016)
 - b. Line 228 (Biagioli et al 2022) but bibliography says 2021
 - c. Line 250 Is Sandri et al 2023 the same that Sandri et al (this issue)? If yes please change Sandri et al 2023 citation, if not reference is missing
 - d. Line 334 missing reference (Bisson et al 2014)
 - e. Line 466 review reference (Hong at al, 2016) by (Hong et al.,2016)
2. Figures legend
 - a. Figure 3 wrong legend (solid fraction title does not correspond with the caption and text)
 - b. Please review Figure 5, the descriptions in the text (from line 277 to 304) do not correspond to the assigned label (a,b,c,d,e,f) figures that seem to be switched.
 - c. Lines 443 are talking about Figure 8 but Figure 7 is referenced
 - d. Line 447 ¿Is it possible to show in Figure 7 the locations mentioned in line 447 ?
 - e. Missing (a,b,c,d) in Figure 13
 - f. Line 582 mention Figure 12a (does not exist)
 - g. Missing (a,b,c,d) in Figure 17