

Interactive comment on “Factors controlling erosion-deposition phenomena related to lahars at Volcán de Colima, Mexico” by R. Vázquez et al.

R. Cioni (Referee)

rcioni@unica.it

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The manuscript by Vasquez et al. represents a very nice and easy to read contribution dealing with the erosional-depositional processes related to lahars at volcano Colima, Mexico. Basing on accurate topographic measures of the morphological evolution at several checkpoints along a main valley, the Authors discuss the local effects of slope and cross section width and shape in controlling the behavior of the lahar in terms of sedimentation/erosion. The collected data are then compared with the results of modeling with FLO-2D software. The results are relevant for hazard assessment scopes. The data are presented in a very clear way, and their discussion is exhaustive. Despite this, the Authors does not tackle with the problem of sediment availability, nor in terms of mass or grainsize. This could be a further development of the research that could represent an important step forward in the complete understanding of lahar

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bulking and debulking processes. Despite the already high quality of the manuscript, I suggest some minor revisions, with a partial rewriting of the discussion, before it is accepted for publication. Some main points in the discussion are not clear:

- comparison of field data with FLO-2D results is not fully convincing. Modeling results are obtained using input data derived from a preceding study of a very large lahar (11 June 2013), while they are compared with the observed modifications at the different checkpoints along the studied valley over longer periods (one year), characterized by several lahar episodes of lower magnitude. Comparing these data is not straightforward, and some additional discussion on the rationale used to do this comparison is needed. - As the used model does not consider sediment transport, it is not clear how the effects of mass-rich hyperconcentrated flows and debris flows like those occurred in the past at Colima volcano can be reproduced using this model. Also in this case, additional discussion addressing this problem is needed. - Authors suggest that during 2013 and 2014 lahars were triggered by long-lasting low intensity rains, while in the preceding years lahars occurred only after short-lived rains. In my opinion this conclusion is not well documented (lines 338-347; Fig.8), so resulting not completely convincing. Authors in fact should demonstrate for example that short-lived intense rains did not produce lahars in the 2013 and 2014 seasons (how many of these episodes?), and on the other hand that the same occurred in the preceding years for long-lasting events - Given the importance of loose sediment availability in the generation of debris flows, the Authors should discuss more extensively the possible effects of volcanic activity on sediment availability, only just mentioned in this version of the manuscript.

In the hope that these suggestions can be useful for a substantial improvement of this interesting contribution best regards Raffaello Cioni

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