

Interactive comment on “Tree-roots control of shallow landslides” by Denis Cohen and Massimiliano Schwarz

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We thank you for your constructive comments on our manuscript. We have revised our manuscript taking into account comments by reviewers 1 and 2 and suggestions by the editor. Here we respond directly to the editorial comments.

1. Shorten and streamline abstract. Done.

2. Focus the introduction The introduction was re-organized to separate the importance of root reinforcement for vegetated slope stability (and how our model provides a new approach) and the motivation and background for our work (geomorphic importance of landslide processes in general). We kept the second part

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because we could not find an equivalent discussion in the shallow landslide/slope stability literature. We feel this motivation and description of the geomorphic aspect of landslide and slope stability is essential and brings in the 'big picture' often needed for motivating research.

3. Separate result from the discussion. In general we would agree that results should be separated from discussion. However, here, because of the quantity of results provided by our new analysis, separating results from interpretation would mean going back and forth several pages for finding figures and explanatory text. We have organized our results and the associated discussion by clearly separating (using subsection headings) the various effects related to root reinforcement. We feel separating results that basically show graphics, with discussion that analyze the graphics would be more confusing, and end of lengthening the paper, already long. Grouping results and discussion when various aspects of a model are evaluated is commonly done (e.g., D'Odorico and Fagherazzi, 2003; Lehmann and Or, 2012) and we believe, in this specific context, that it is clearer.

4. Added value of model and critical appraisal of validity. We have added material in the main text and in the conclusion that better specifies the improvement our model brings to slope stability calculations. See details in the response to the two reviewers.

References

- D'Odorico, P., and S. Fagherazzi (2003), A probabilistic model of rainfall-triggered shallow landslides in hollows: A long-term analysis, *Water Resour. Res.*, 39(9), 1262, doi:10.1029/2002WR001595.
- Lehmann, P., and D. Or (2012), Hydromechanical triggering of landslides: From

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progressive local failures to mass release, *Water Resour. Res.*, 48, W03535, doi:10.1029/2011WR010947.

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