Interactive comment on “Physically based modeling of rainfall-triggered landslides: a case study in the Luquillo Forest, Puerto Rico” by C. Lepore et al.

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Dear Prof. Romano,

Thank you for your interest in our contribution and the constructive comments.

We will carefully check the reference list and add the missing references you mentioned into the revised manuscript. Please find here the missing references (please note that De Vita and Reichenbach, 1998 is De Vita et al., 2008):


The greek letter ‘chi’ mentioned in your comment refers to a parameter in the shear strength equation for unsaturated soils stated by Bishop (1955, 1959). As reported by Vanapalli and Fredlund (2000) and by many other scientific works (Bishop and Blight, 1963; Fredlund and Rahardjo, 1993; Loreta B. and Khallili, 2002; Khallili et al., 2004; Wan et al., 2011; Zargarbashi and Khalili, 2011) ‘chi’ refers to an ‘effective stress parameter’ which is assumed to vary from 0 to 1 and which depends on the effective saturation, but it is not necessarily defined as the effective saturation. In fact, the ‘chi’ parameter can also be expressed through different formulations, as mentioned in our manuscript (Line 12-13, pag. 8).

According to your suggestions, we will better specify the definition of the ‘chi’ parameter in our manuscript, making explicit reference to the effective saturation. However we agree with Bishop (1955; 1959) and the large portion of literature listed above that defines it as a parameter.

Since the effective saturation is a function of the matric pressure head, then if follows that the shear stress depends on the matric pressure head, according to your observations.

We appreciated the time you spent in reviewing our manuscript and your comments, which will be surely helpful for revising the manuscript.

References

Bishop, A. W., 1955. The use of the slip circle in the stability analysis of slopes,


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