

***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 Authors, I am reading with interest your contribution to HESS-D, and would like to raise a few points and also make some preliminary comments.

Firstly, some articles are cited in the text, but then not reported in the reference list (e.g. De Vita and Reichenbach, 1998; Vanapalli and Fredlund, 2000). Please check.

Moreover, I think that your definition of the symbol with the Greek letter “Chi” is somewhat imprecise. Actually, “Chi” is the effective saturation [see your Eq.(2)] and it should be considered a variable rather than a parameter. Strictly speaking, the state variable is the volumetric soil water content (THETA). In your Eq.(2), the soil parameters are the

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saturated (THETA<sub>sat</sub>) and the residual (THETA<sub>res</sub>) soil water contents.

Allowing for the way you have defined “Chi” in Eq.(2), the magnitude of this variable necessarily vary between 0 and 1 (it is a scale operator). Therefore, I think you cannot say that you “assume” that “Chi” varies between 0-1 since this variable cannot take on values greater than 1 or less than 0.

More correctly, I would suggest you should say that Eq.(1) accounts for the effective saturation function "Se(h)" (rather than parameter “Chi”), where “Se” is the effective saturation and “h” is the matric pressure head (which has dimensions of length). In short, it is the well-known water retention function. Therefore, a matter that can deserve a discussion in your paper is that, bottom line, the shear stress [as defined by your Eq.(1)] depends on the matric pressure head, h.

I have suspicion (but it is only my very personal view) that the authors were a bit misled by the paper of Vanapalli and Fredlund (2000), who addressed the term “chi” as a parameter and also make some other statements that can generate confusions in some readers.

I hope that these comments may help the authors in the reviewing phase of this interesting manuscript.

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