

## ***Interactive comment on “Development and validation of the Terrain Stability model for assessing landslide risk during heavy rain infiltration” by Alfonso Gutiérrez-Martín et al.***

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We maintain that the manuscript is well within the aims of NHESS. We provide in the attached supplement, the contestations and contributions to the questions raised by you.

Thanks for your comments

regard greeting

### GENERAL COMMENTS

(1) This paper deals with the ability to predict a landslide failure curve and the slope  
C1

factor of safety with a terrain stability (TS) analysis. Overall it is written in a good English, but I believe it is not as innovative as claimed for considering rainfall infiltration in the calculation of the factor of safety. I suggest focus on the ability to well-predict the landslide failure curve and surface area.

(2) We appreciate your comments on our model and specifically the ability to predict well the slip failure curve and the area of the breakage surface. We continue to believe in the originality of our model, incorporating the rainfall infiltration in the calculation of the safety factor with a terrain stability, by means of the infiltration factor of the Spencer method and its treatment in the calculation model implemented in Matlab. The TS method is a simple, but versatile computational procedure that is suitable for a normal computer

In addition, we also re-focus the paper on the ability to well-predict the landslide failure curve and surface area. In the intro a new text has been added:

(3) “The new developed software is fast and accurate in resolution of landslide failure curve and surface area, including the infiltration effects.”

(1) The literature of relevance has not been adequately cited. I recommend reviewing more methods for slope stability analysis.

(2) We have incorporated the references in the introduction section and in the specific comments, which we believe improve the application literature. In the revised final version of the paper, we include a brief description of the state-of-art in order to clarify the improvements of our work.

(1) Chapter 2 is very confusing and the paragraphs are disjointed. As is, it is not easily readable. In chapter 3, the test should be described more accurately and the center of the failure curves should be shown in, at least, the first figure (Figure 2).

(2) Chapter 2 has been improved by incorporating in specific comments clarifications and syntax improvements, the center has been incorporated in Figure 2 (a new figure

2 has been done).

(1) In chapter 4 there is the need to mention the date of the slide.

(2) The date of the landslide has been introduced, which we had not included in the text, but we had marked it in figure n. °7, in the histogram. See specific comments.

(1) Both chapter 3 and 4 miss the description of the calculation of the pore pressure parameter. Move lines 421-444 to chapter 2 because they describe the characteristics of the TS model compared to the STB 2010.

(2) In the specific comments section show the description of the calculation of the pore pressure parameter. We have clarified this question.

Following your suggestions, we have moved lines 421-444 to chapter 2 because they describe the characteristics of the TS model compared to the 2010 STB.

(1) Please, check references consistency with the journal guidelines. For other comments and technical corrections see the attached file.

(2) We have reviewed and verified the references of coherence with the guidelines of the journal.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2018-192/nhess-2018-192-AC1-supplement.pdf>

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2018-192>, 2018.