The aim of this work/manuscript is the development of a software for single slope stability. A case study and a comparison with another software is presented. In my opinion, the main originality of the paper is represented by the inclusion in the software of the infiltration effects, according to the lacking in other software slope stability based, but the used theory (Spencer's method) and the way to calculate the interstitial pressure on the slice base is well known. Therefore, the proposed model is not innovative and the authors should give more emphasis to the originality of the developed software, clarifying the advantages also in term of time simulation. I suggest the authors to include a block diagram of the software in order to explain better their algorithm from the user definitions to outputs/results. Moreover, a sensitivity analysis of the parameters is missing: I suggest for example to add some plot, e.g., the safety factor varying the interstitial pressure coefficient r_u, the center of failure curve, the number of slices, the density of soil, etc. To me, in conclusion, the paper needs some improvements and major revisions should be required.

Specific comments:

The **section 1 (Introduction)** must be expanded citing other works that develop/use stability model, e.g.:

Anderson MG, Howes S (1985). Development and application of a combined soil water-slope stability model. Q. J. Eng. Geol. London, 18: 225-236

Crosta GB, Frattini P (2003). Distributed modelling of shallow landslides triggered by intense rainfall. Natural Hazards and Earth System Sciences (2003) 3: 81–93

Iverson RM (2000). Landslide triggering by rain infiltration. Water Resources Research 36(7): 1897-1910

Lu N, Godt J (2008). Infinite slope stability under steady unsaturated seepage conditions. Water Resources Research, Vol. 44, W11404, doi:10.1029/2008WR006976

Rossi G, Catani F, Leoni L, Segoni S, Tofani V (2013) HIRESSS: a physically based slope stability simulator for HPC applications. Nat Hazards Earth Syst Sci 13(1):151–66

Wu W, Sidle RC (1995). A Distributed Slope Stability Model for Steep Forested Basins. Water Resour. Res., 31(8), 2097–2110, doi:10.1029/95WR01136

Then I would mention empirical model that relies on rainfall thresholds, for example:

Aleotti P (2004). A warning system for rainfall-induced shallow failures. Eng Geol 73:247–265

Caine N (1980). The rainfall intensity duration control of shallow landslides and debris flows. Geografiska Annaler. 62A, 1-2: 23-27

Govi M, Mortara G, Sorzana PF (1985). Eventi idrologici e frane. Geol. Appl. e Idrogeol. XX, 2: 359-375

Guzzetti F, Peruccacci S, Rossi M, Stark CP (2007). The rainfall intensity-duration control of shallow landslides and debris flows: an update. Landslides, Vol. 5:3-17, doi: 10.1007/s10346-007-0112-1

Martelloni G, Segoni S, Fanti R, Catani F (2011). Rainfall thresholds for the forecasting of landslide occurrence at regional scale. Landslides DOI: 10.1007/s10346-011-0308-2

Wilson RC, Jayko AS (1997). Preliminary maps showing rainfall thresholds for debris-flow activity, San Francisco Bay Region, California. US Geological Survey Open-File Report 97-745 F

Moreover should be cited papers in which other approaches/theoretical studies for landslide prediction are used (for triggering and/or propagation), e.g.:

Crosta GB, Imposimato S, Roddeman DG (2003) Numerical modelling of large landslides stability and runout. Nat Hazards Earth Syst Sci 3(6):523–538

D'Ambrosio D, Di Gregorio S, Iovine G (2003) Simulating debris flows through a hexagonal cellular automata model: SCIDDICA S3-hex. Nat Hazards Earth Syst Sci 3(6):545–559

Iovine G, Mangraviti P (2009) The CA-model FLOW-S* for flow-type landslides: an introductory account.Proceedings of the 18th World IMACS congress and MODSIM09 international congress on modelling and simulation, 13–17 July 2009, pp 2679–2685

Martelloni G, Bagnoli F (2014) Infiltration effects on a two-dimensional molecular dynamics model of landslides. Nat Hazards, 73(1):37–62

Martelloni G, Bagnoli F, Guarino A (2017) A 3D model for rain-induced landslides based on molecular dynamics with fractal and fractional water diffusion. Commun Nonlinear Sci Numer Simulat, 50:311–329

Patra AK, Bauer AC, Nichita CC, Pitman EB, Sheridan MF, Bursik M, Rupp B, Webber A, Stinton A, Namikawa L, Renschler C (2005) Parallel adaptive numerical simulation of dry avalanches over natural terrain. J Volcanol Geotherm Res 139:1–21

The **section 2 (Terrain Stability model development)** needs some corrections:

1) The meaning of some parameters is missing in the text, e.g., in the equation 3 *R* is the radius of the curvature and α is the angle of the slope referred to each slice (I suppose); in the equation 7 γ is the density of soil and *h* is the mean height of slice (if the height is not constant). Please check these!

2) In my opinion is not clear how the pore pressure is calculated by means of equation 7., i.e., how is the interstitial pressure coefficient r_u calculated (according to heavy rainfall event)? Then, how does the equation 8 (Mohr-Coulomb law), for the calculus of *u,* come into play? In the article of Spencer (Spencer, 1967), assuming a homogeneous pore-pressure distribution as proposed by Bishop and Morgenstern (1960), the mean pore-pressure on the base of the slice can be written just like the equation 7 that is used for the calculation of the safety factor (substituting expression of *u* in equation 5). Please clarify the need of equation 8!

The **section 3 (Terrain Stability (TS) model behaviour tests)**, in my opinion, should be renamed **Terrain Stability (TS) algorithm and tests** adding these points:

1) I suggest to include a block diagram of the software in order to explain in detail your algorithm from the user definitions to outputs/results.

2) As sensitivity analysis of the parameters is missing, I suggest for example to add some plot, e.g., the safety factor varying the interstitial pressure coefficient r_u, the center of failure curve, the number of slices, the density of soil, etc.

Line 206: It is not “centre”, but center. Please, check the paper if other typos are present!

Concerning the **section 4:**

Line 415: I would not say “our innovative TS model”, but “our original algorithm”.

Lines 421-444: I would add this part in the section 3 where is requested the explanation of the algorithm (software).