

Interactive comment on “Determination of rainfall thresholds for shallow landslides by a probabilistic and empirical method” by J. Huang et al.

Anonymous Referee #2

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General comments:

In general the paper is well written and the objectives of the research are clear, but it lacks of novelty and shows several issues to be resolved before it can be published. The main issue of this paper is the missing of a real validation of the methodology, since one pluviometric event (with MAX hourly intensity recurrence time over 100 years) is not sufficient as validation. The whole paper is based on the outcomes of the work of Jan et al. (2002), that is a kind of internal report or something similar, so cannot be read from international scientific community. This work should be better described, as pointed out in the specific comments. In my opinion this work can be published after

C1317

several major revisions.

Specific comments:

The authors calculated several probability threshold, but they used only three, so it useless to describe how they calculated them and to plot these thresholds. The blue and red lines described in sections 3.2.1 and 3.2.2 are defined on the basis of the lowest landslide events and highest no-landslide rainfall respectively. So it is quite strange that these lines, defined by an empirical (or, better, by a graphical) approach, are perfectly parallels.

Page 3492 rows 14-15: Authors write that they selected only ca.50 events that not triggered landslide. In my opinion they should consider all the rainfall events recorded from 2007-2014 to properly calculate the probability of landslide occurrence and therefore the thresholds. Furthermore the number and the location of rain gauges are missing. (Location could be added to fig.4).

Page 3492 rows 24-25: The whole paper is based on the paper of Jan et al. (2002), that is not an accessible journal paper; the authors should be better describe how Jan et al. defined the I and R values for the beginning and the end of a rainfall event, otherwise it looks like they are defined subjectively. In this case the whole work is not suitable to be used in a landslide warning system. Furthermore that work (Jan et al. 2002) was developed for debris flows, but in this paper it has been applied to shallow landslides. Please clarify these points.

Page 3492 row 26 and page 3493 row 1.: “. . . the end is when the rainfall intensity is less than 4 mm for a period lasting 6 h.” Do the authors mean 4 mm/h for 6 hours or 4 mm in 6 hours (~ 0.7 mm/h)? Please clarify.

Page 3493 section 3.2.1 and 3.2.2., figure 5. The blue line is not under the lowest points. Point at coordinates $\sim (100,8)$ seems to be above this line. Similarly points used for red line seem to be under and above the line. Please check.

C1318

Pag 3494 row 1: "... lh is the hourly rainfall intensity". In page 3492 authors state that lh is maximum hourly intensity, now that it is hourly rainfall intensity. Please clarify.

Pag. 3495 rows 11-12: "There are 16 points of landslides in the area that occurred where PRO = 10–50% (C10–50), as shown in Fig. 6, and 38 points in the area where PRO = 10–90% (C10–90)." The number of landslides should be 50 (16+38=54!), as stated in section 3.1 Please check the number of landslides.

Equation 4: the W parameter seems to be not used in the following equations. Please clarify where and if it is used; otherwise please consider removing this equation.

Pag. 3495 row 3: "are defined" is defined

Pag 3496 row 15: "...the rainfall intensity..." "Is this maximum hourly rainfall intensity?"

Pag 3497 row 4. "At 10 a.m. the point is down in the diagram again in the red zone." The thresholds have been defined using the maximum hourly rainfall intensity, as described in section 3.2, so once the maximum has been reached, it is not possible to have lower intensity values in the graph. Please check.

Pag. 3497 row 1: "landslides, induced" landslides induced

Fig. 4 some landslides seem to be located in plain areas. Please clarify.

Fig. 6 This figure is useless. The necessary thresholds have been already presented in fig. 5 and 7. Please consider to remove it.

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