

## ***Interactive comment on “Headwater sediment dynamics in debris flow catchment: implication of debris supply using high resolution topographic surveys” by A. Loye et al.***

**Anonymous Referee #3**

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The paper entitled "headwater sediment dynamics in debris flow catchment: implication of debris supply using high resolution topographic surveys" presented by Loye et al. constitutes a very interesting study on debris supply rhythms for debris flow initiation. The paper is long, but presents lots of results, also using numerous previous studies that have been carried out in the same torrent. The paper would gain being presented in a more straightforward way, and would benefit of an English editing. Here are some comments the authors might consider while revising their manuscript:

P. 2, line 25: could you specify how you consider snowmelt identical to rainfall? Snowmelt has been proven as a different triggering factor from rainfall (intense or long lasting) (ex. Decaulne et al., 2005 in *Geografiska Annaler*), and has also been denied,

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or with a very secondary action in some studies (ex Jomelli 2004 in *Climate Change*). P. 3, line 3-4: how do you compare debris flow amounts with initiation mechanisms in a quantitative way? P. 6, line 27: what are the criteria to recognize and then eliminate erroneous points? P. 6, line 17-20: has this be previously validated by experiments? Please use a reference. P. 10: equations should be numbered. P. 12, line 4 'whereas b tends to be rather site independent'; why don't you say 'is site independent'? why are you so cautious? P. 12, line 16: what make you select the duration of each period, as they are uneven in time. Please be more specific on this and provide an explanation earlier in the pape. P. 18, line 18: you specify that freeze-thaw is a major key for debris supply, contributing to rockfall that will later feed the debris flows. You may also consider the triggering factors for debris flow initiation, and especially snowmelt of snow avalanche deposits (Bardou and Delaloye, 2004 in *NHESS*). P. 20, line 8: you mention 'about' before the calculation; that's a quite relevant word, which might lead to very different result according to the mentionned quantities.

Overall, this is a very significant contribution that will be abundantly cited in the future.

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