

Interactive comment on “A model of hydrological and mechanical feedbacks of preferential fissure flow in a slow-moving landslide” by D. M. Krzeminska et al.

D. M. Krzeminska et al.

d.m.krzeminska@tudelft.nl

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We appreciate the accurate suggestion of the Reviewer aimed to the constructive improvement of the manuscript.

The aim of this paper is to analyse the Super-Sauze landslide (South French Alps) from a hydrological point of view taking into account the dominant role played by fissures. Two theoretical relationships were established in order to account on the dynamic nature of fissure network characteristics: 1. relationship between fissure connectivity and soil moisture content 2. relationship between fissures formation and stability state

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After the judgement of the Referee we agree that the second relationship is not sufficiently justified in the paper yet and more detailed explanation is needed.

It is important to stress that in this paper the vertical cracks resulting from drying – wetting circles are not considered and the term “fissures” refers to geo-mechanically induced cracks only. These fissures form and propagate as a result of tensile opening, sliding and tearing (induced by soil mass movements). For the Super- Sauze landslide it is mainly tensile fracturing that dominates the fissure formation at the free surface.

It is also important that fissures are conceptualized as volumes of increased porosity and increased hydraulic permeability, not directly open ‘cracks’ (Krzeminska et al., 2012).

Therefore we conceptualized the general relationship between factor of safety (which serves here as a proxy for the excess shear stress that cannot be accommodated by a particular soil column and, thus, can lead to soil extension, e.g., appearance and/or extension of shear and tension fissures) and fissure volume. Therefore we assume that when the soil column is relatively stable ($f_s > 1$) there are no, or very limited, fissures present within this soil column and the volume of fissures increase with decreasing f_s .

We agree with Reviewer that it is necessary to stress that proposed relationship is an empirical one that tries to link f_s to fissure occurrence and that it is a simplification of the true mechanism of formation and propagation of fissures.

We will include in the manuscript adequate information needed for clarification and better understanding of above mentioned issue.

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