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Interactive comment on "Improving predictive power of physically based rainfall-induced shallow landslide models: a probabilistic approach" *by* S. Raia et al.

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We agree that the sentence quoted by the Referee is poorly written. We rephrase it in the final version of the manuscript, to make clear that the existing slope stability models are intrinsically deterministic. This means that, given the initial conditions and parameter values, the outcome of a single run of the model is fully deterministic. We acknowledge that the references cited by the Referee, which were only partially known to us, adopt a probabilistic approach similar to the one implemented in the present work. We discuss the new proposed references in the final version of the manuscript. Nevertheless, the various models are not all equivalent, and we maintain that the prob-

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abilistic improvement of the modified version of TRIGRS is a relevant one, since it takes into account at the same time many aspects relevant to slope stability and, in addition, it is capable of reproducing several empirically observed properties of landslides, as recently shown in Alvioli et al. (2013). Concerning the hydro-geological setting of the study areas, we have used all the available information to run the simulations. For example, the choice of setting the water table to a fraction of the soil depth, in the Frontignano area, was dictated by the following reasoning. Since the depth of the water table is an important initial condition of the model, as correctly stated by the Referee, we have decided to adopt a long rainfall period, starting from an almost dry initial condition to reach a realistic depth during the storm. We didn't set the water table to the maximum soil depth in order to take into account the fact that the simulation is intended to be representative of typical winter conditions in both areas, where the soil always contains some amount of water.

We agree that the highlighted text should be amended.

References:

Alvioli, M., Guzzetti, F., Rossi, M., (2013). Scaling Properties of rainfall-induced landslides predicted by a physically based model. Accepted in Geomorphology; DOI 10.1016/j.geomorph.2013.12.039 Available at http://arxiv.org/abs/1306.1529 [physics.geo-ph]

Interactive comment on Geosci. Model Dev. Discuss., 6, 1367, 2013.