

Interactive comment on “Snow Accumulation-Melting Model (SAMM) for integrated use in regional scale landslide early warning systems” by G. Martelloni et al.

Anonymous Referee #2

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General Comments

The paper propose a new snow accumulation-melting model (SAMM) to be used in a landslide early warning system, as the coupling of snowmelt models and landslide hazard assessments is not well established and only a few examples exist. SAMM is an intermediate model between physically based models and empirical temperature index models, with the objective of simply modify the rainfall measurements used as input data in landslide warning systems.

It's not clear the reason of building a new snow accumulation-melting model. What is

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the added value of this model in comparison with the existing ones? Does it offer better performances than a simple temperature index model for the objective of a landslide warning system?

Furthermore, a number of 13 empirical parameters seems to be very high for a model which is not a distributed modelling of the snowpack but just want to modify the rainfall measurements used as input data in a system based on a series of statistical rainfall threshold (SIGMA).

The model seems to work only using heated rain gauges. Try to underline it since the beginning of the paper, as it is an essential help in the accumulation module

Finally it is asked to better describe the results obtained by the implementation of SAMM in SIGMA, with the exact number of false alarms, missed detects and hits (table 3).

Specific comments

P9395 L26: what is the meaning of “reference rain gauge”? For each TU, SIGMA uses just one rain gauge to evaluate threshold exceeding?

P9400 L18: Eq. (22) doesn't exist in the paper

P9401 L2: in Fig. 1 there are the position of the references rain gauge. Are the snow depth sensors in the same positions?

P9403 L10: is Fig. 9 correct? Or the effects of change are displayed in Fig. 10?

P9403 L10-15: try to better explain; furthermore the great sensibility shown with the change of 1°C seems not to agree with the analysis displayed in Fig. 9

P9405 L10: check if the atmospheric pressure is indeed an important parameter in snow modelling (also P9393 L28: Surface pressure)

P9418 Fig. 6: the use of a moving average seems to create important mistakes in

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reproducing the single snowfalls, differences in the snow height values and in the snow depletion immediately after the snowfall. Could it has been a problem in the validation process?

P9422 Fig. 10: insert the measured values.

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