

Interactive comment on “Snow gliding and glide snow avalanches: recent outcomes from two experimental test sites in Aosta Valley (NW Italian Alps)” by Margherita Maggioni et al.

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This is a short paper that reports on two years of observation of snow gliding during a field survey conducted near Gressoney (Italian Alps) from winter 2013-14 to 2014-15. Snow gliding and glide avalanches are not a new threat, but the striking increase in the frequency of damage they cause has pushed scientists to further investigate the underlying physical processes, while for engineers and technicians in charge of ski resorts and high-elevation infrastructures, they have been a growing source of concern. Just for this season, a glide avalanche occurred in Crans Montana (Switzerland), killing one patrolman (but the death toll could have been more significant).

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This paper is interesting. After reading it, I was wondering why the authors did not continue their field investigations over a longer time period, and why they submitted this paper four years later. While the authors' findings do not lead to a more accurate picture of the physical processes, the site comparison shows disparate behaviours and the diversity of explanatory factors. An interesting observation concerns the part played by the interface between the ground and snow cover. When the ground's upper layers are saturated with liquid water, then ground resistance (to snow creeping and gliding) is certainly much lower. As the authors state, little is known about this process. Empirically, in a few ski resorts, the ground is drained, with a positive influence on gliding rates. This has been, for instance, attempted in Saint-François-Longchamp (Savoie, France), with success.

On the whole, I have little to criticize. In absolute terms, I would have preferred a longer paper presenting several years of monitoring, but this may have not been possible. So, a short paper is better than no paper at all. Here are my remarks, mostly of editorial nature: 1) The paper is fairly well written, but in places, the English has to be corrected and polished. I had to read sentences several times to understand what the authors meant (e.g., p. 4, L38-39, “not like replications” -> the phrasing sounds a bit strange and unnecessary as it says the same thing as “behaved differently”). Use of acronyms should be limited to standard abbreviations. “Pista Nera” is easier to read than PN. 2) Page 2: although liquid water is present in most documented cases of snow gliding, it happens sometimes that dry snow covers also glide. This has been, for instance, observed by Damien Margueritat in Chamonix/Le Brévent (Margueritat, D., Retour d'observations sur les plaques de reptation, Neige & Avalanches, 152, 18-22, 2016). On the same page, I am not sure that the partitioning into cold and warm events is sound. On the one hand, these adjectives are borrowed from common language (boiling water is warm, ice is cold), and scientifically they do not tell us much. On the other hand, snow gliding arises from multiple scenarios, and to a large extent is history dependent. I urge the authors to be more specific in their introduction. 3) Figures 4 to 7 are very difficult to read (use larger font sizes). The same holds for Fig. 9. The paper

C2

could be accepted after some minor adjustment of the text and figures.

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