

All Line numbers given by me refer to the track changes document!

Given that the first answers are on the style of "we we can do this or that", I expected much more concise answers of what you actually did. But, most of the answers are still the same vague replies making finding the changes very difficult and cumbersome. I was not able to find all the answers to my first questions. Please carefully check my first review, and discuss with you co-authors if they are properly captured.

Most of my comments to improve discussion of subsection 4.3 and 4.4 are not answered or done. Please discuss them properly.

I find the story of the manuscript still rather difficult to follow. And the order of informations is not the best. In general, I have the feeling, that the experienced co-authors were not much active during the reviewing of the manuscript and too much effort is therefore handed over to the external reviewers.

The publication has definitively improved and has potential, but still needs some more effort. Please help the reviewers by more clearly state what you changed and where.

R2-2: OK.

R2-3: The suggested discussion of the simplification that  $\alpha$  is temperature independent is missing. The authors only state it's constant value for cold and warm avalanche without clarifying what cold and warm means.

R2-4: I can not find the updated part in the "first paragraph on avalanche model" regarding the VdIS calibration. I see one sentence clarifying the calibration process at the very end of the introduction, however, to the reader not familiar with the VdIS topography, the sentence is rather confusing. When summarizing the current state of the model from literature (e.g. R2-2), I would like to see also a paragraph about the calibration.

R2-5: Thank you for providing the observed avalanches of the last 60 years. Obviously, not most avalanches reach the road, but many (if not most) avalanches reach the valley flow, e.g. the flat part. Now I can better understand why you choose the idealize plane topography.

I am still missing the distances along the idealize plane topography (you give elevation and horizontal distance), but your verification works on the distances.

Naming: idealize plane (e.g. Fig 4) or inclined plane (e.g. Fig 8). Stick to one.

Regarding your definition of avalanche length or runout distance using the longest distance between two points in the affected area: this is a rather unusual definition, but it seems to work on most avalanches as they are much longer than wide. However, please add 1 or 2 sentences explaining this (and the limitation).

R2-7: I can not find the mentioned train of thoughts in the publication. I think, that discussion not using the VdIS data is important.

(BTW: VdIS has the most complete dataset in the world, your argument with SNOWPACK is of secondary importance and should not be mentioned in the discussion.)

Other comments:

- Line 90: Add reference to your supplementary material
- Line 98: The name of you institute is not correct, but is also not important here. Please remove.
- Line 148 and Line 138: Duplication of sentences. Please reread and revise the text between them!
- Fig 8: remove the points for warm temperatures. You can not show data you are not convinced of, and tell the people to take caution. Just dont show wrong / untested results.
- Line 515: How does the newly added subsection 4.2 on release length / angle and this sentence work together? From 4.2, I understand that only for very steep release areas the powder cloud goes further than the dense part (which is rather counter-intuitive, please discuss in more detail, e.g. what is terrain friction?)
- Line 522: The comparison between estimated front or approach velocity and maximum peak field velocities does not work! Please compare the velocities of Fig2 to equivalent values (extract the approach distances from the model run at the corresponding timesteps). See below to R2-32.

Fig14: Color scale of pressure has only one value and the wrong unit

- Line 523ff: I find the comparison with volumes from the drone data rather difficult to follow. Please rephrase and explain to the reader what is important. (E.g. what is the difference you want to explain in Line 531?). Fig12 indicates core volume up to  $120.000\text{m}^3$  and erosion volumes up to  $80.000\text{m}^3$ , but in Line 529 is only  $30.000\text{m}^3$  deposit. On the other hand, the drone data looks rather like no deposit at all (inside the outline to left and right of the outline has a fairly similar coloring and pattern). Can you explain this more in depth?

Fig 3: One can see that there has been significant erosion in the main part of the track (blue colors are basically no/only little snow left), however, in the deposition area most deposition is at 1m which equates to the normal snow cover prior to the event. Where do you expect is all the mass from the track? Please explain or mention this discrepancy.

- Line 538ff: And what does this mean for the simulation? Is the simulation now bad?

R2-16: I doubt there is a commonly accepted way how to estimate the snow temperature for avalanche dynamics purposes. It would be helpful for the reader to include one sentence to mention the discrepancy between the temperature in the release zone and the nearby flat field station measurements.

R2-29: I dont see the mark at  $0.3\text{C}/100\text{m}$ . And line 407 shows you changed from  $0.3$  to  $0.5\text{C}/100\text{m}$ . Please revise and be consistent.

R2-30: The sentences still says that a deep snowcover is need for the longevity of PSAs, and your answers suggests that you drive the erodible layer with the new snow. So, please rephrase the sentence and clarify. Also to R2-31: You should present the reader also with the limitations, and that the approximation fails for extreme avalanches that basically erode everything.

Fig10: Unfortunately, the modification of the figure removed the initial snow temperature of the mountain. Can this broad back?

Line 450: "increase by 3C from -8C to -2C" does not work...

R2-32: Well, usually the questions from the reviewer are pointing to some missing information which could be of interest to the general reader and not only to the reviewer alone.

So, you are able to extract some velocities of the avalanche in Fig. 2, now here you show the frontal evolution over time. You can estimate a velocity from this plot inbetween the 5s steps, and you have another measurement to compare the simulation against, e.g. in line 520ff.

R2-33: Adding half a sentence is not a discussion of other literature. Please extend the discussion the literature mentioned in the first review round!

Similar holds true for R2-35.

R2-37: OK, you estimate some velocities from the video, but you don't use this information. As mentioned earlier, please add the front velocity to Fig.14 or to a similar figure.

R2-40: I can not find the part in the manuscript where you comment / discuss on the issue. Please refine and clearly point to the part in the manuscript

R2-40: You refuse to either redo the simulations, or to properly discuss the given question. I feel like this is one of the main points of the paper, but not at all discussed.

Fig15 (comment F16): you did not annotate the arm.

Line 533: Well, the answer you gave in the review manuscript should be given in the paper manuscript. You have to tell the reader what you want to say. Simply say we exclude this and that opens more questions that is helpful in any way.

Line 535: Still unclear.

Line 410: This sentence is still unexpected and does not make much sense without additional information. Please write with a couple of sentences this information and what implication this wind scour involves.

Line 580ff: The last paragraph in the Conclusion should go to Outlook (If one needs an outlook explicitly, better move those thoughts to the discussion).

Acknowledgments need update to state review by Dieter Issler and anonymous.