

Dear reviewer,

thank you very much for commenting and providing helpful suggestions on the manuscript. Below we have pasted your comments in blue, our point-by-point responses are given in black.

Specific comments:

First sentence of abstract: This sentence might seem a bit confusing and complicated for readers not familiar with slab avalanche release. I suggest making it simple: "For a slab avalanche to release, we need crack propagation in a weak snow layer beneath a cohesive snow slab." Then continue describing crack propagation, etc.

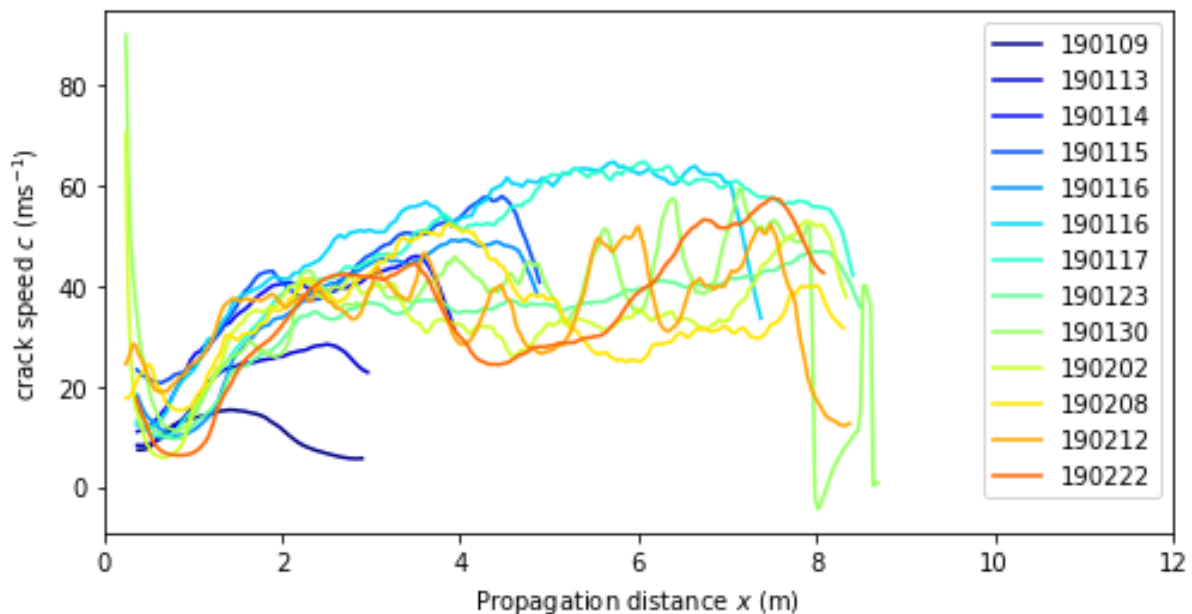
Thanks for the suggestions. We will change this sentence so that it becomes clearer.

Abstract again: a PST is not common knowledge, I would think. Maybe write "we performed crack propagation experiments...". You can then describe the PST in more detail in the intro and/or methods section.

We will reword the sentence and not introduce already the PST in the Abstract.

Figure 2: What about the crack speed curves for the other experiments? It would be interesting to see the others as well. Are they very similar or completely different? If there are differences, how can those differences be explained?

The crack speed curves of experiments resulting in full propagation had similar shapes (see figure below).



We think the data shown in Figure 2 is representative. Experiments resulting in crack arrest showed greater differences and larger uncertainty. We will make these data available with publication at our institutional repository www.envidat.ch.

Line 225: How valid is the assumption that the slab and substratum are in the same stress state before and after crack propagation? Will there be no plastic deformation within the slab due to the collapse?

Admittedly, we cannot easily verify this assumption. However, within the limits of our measurement accuracy we did not detect residual strain in the slab and substratum (with the exception of the explicitly mentioned experiment in line 275 – see next comment). In the revised manuscript we will state this issue more clearly.

Line 275: Here you say that the slab was shallow and soft and it broke while cutting the weak layer. How does this fit with the assumption in line 225?

We only observed residual strain in the slab in the experiment of 4 January 2019. Hence, the assumption made in line 225 does not hold for this particular experiment. However, this experiment did not result in crack propagation, and we did not use this experiment to derive crack propagation characteristics such as fracture energies.

Discussion: In general, the first sentence of a paragraph should summarize the paragraph and tell the reader what the paragraph is about. I have the impression that this “first sentence-summary” concept was not used in the discussion, which makes it a bit tedious to read. I suggest adding “first-sentence-summaries” at the beginning of the paragraphs.

Thanks, for the suggestion. We will follow your advice in the revised manuscript where we deem it necessary.

Technical corrections

Line 52 and at many further places throughout the document: Variable identifiers (in our case the f and the dyn) are not italicized.

We will change this in the revised manuscript.

Line 78: omit the “initial”

We will change as suggested.

Lines 84-85: firstly and secondly (adverbs referring to the verb “is”)

First and second can be used as adjectives as well as adverbs.

Figure 1b: using a second y-axis (on the right) for the temperature would be more elegant.

We will change as suggested.