Dear Referee 3,

Thank you for reviewing our article. Your remarks will help a lot to improve this article. You raised important questions, which we will try to answer in the point-by-point replies below.

Specific comments:

P. 537, lines 4-6: although references have been given above, I suggest to provide some basic information about the different flow regimes.

We added several sentences to describe the relationship between snow temperature and avalanche flow regime. The most important result of recent research is that temperature controls the amount of free energy in the avalanche. Cold snow leads to mixed/powder type avalanches, etc. Of course, these results have been known for a long time. Today, however, it is possible to simulate different flow regimes because we take into account temperature and density variations (See Vera et al., 2015, Buser and Bartelt, 2015). We include: *"Avalanche flow regime depends on snow temperature and moisture content (Vera et al., 2015). Temperature controls the mechanical behaviour of the snow particles that comprise the avalanche core. Wet snow avalanches form from warm, moist snow and typically flow in a dense, frictional flow regime. Dry mixed/powder avalanches form from cold, dry snow. Dry snow avalanches exhibit a more disperse behaviour and are often accompanied by a powder cloud. Each flow regime is associated with a characteristic impact pressure."*

P. 537, line 22 to P. 538, line 6: first you indicate that "The tree breaking threshold depends on both the avalanche loading and tree strength". And in the end of the paragraph it is mentioned that "Destruction is defined by the dynamic impact pressures". It is not clear to me the relationship between the two of them. Please clarify.

>> We will change the sentence, page 538, line 4/5 to: *"Destruction is defined by the dynamic avalanche loading."* to clarify that we are talking about loading and not pressure.

P. 538, line 10: please clarify what is meant by "intermittent".

>> We use the term "intermittent" – meaning that the impact pressure is not of long duration, rather there is time (a fraction of a second) between particle impacts leading to an intermittent signal. To clarify the term intermittent we include the following sentence in the second paragraph of section 2.1.: *"The avalanche core can flow in a highly disperse, saltation-like manner, especially at the avalanche front. This leads to an "intermittent" impact pressure. We therefore term this flow regime 'intermittent'."*

P. 538, line 20: in 2009?

>> Yes, we will include *"in"* here.

P. 550, lines 16-17: please clarify this sentence: "In total we documented 1120 destructed or non-destructed trees in the avalanche paths", i.e. differentiate between the two classes.

>> We will change the sentence to: *"In total we documented 324 broken, 173 uprooted trees and 710 trees that withstood the avalanche loading."*

3.2 Wet snow avalanche Monbiel, 2008
As the avalanche event was filmed, I wonder if this was an spontaneous or released event? Please clarify.

>> It was a spontaneous event and we will include the word *"spontaneously"* in the first sentence of this section.

P. 551, lines 5-6: was the snow density not possible to be measured?

>> The density of the snow was estimated by Sovilla 2012 and Vera 2015. We will change this sentence to: 'The density of the avalanche deposition was estimated by Sovilla 2012 to be 500 kg/m3 and Vera 2015 estimated that the density of the flowing avalanche was slightly lower, approx. 450 kg/m3. This latter value was used for our simulations.'

P. 551, lines 7-10: this means there was not much forest destruction at this avalanche track? Please clarify. I suggest to indicate for each track the number/proportion of destructed vs. non-destructed trees.

>> See above, we will change sentence p.550, line 16-17. In the lower part of the Monbiel avalanche track all spruces were broken, see Fig. 6. We will clarify that by including *"… the lower spruce stand, where all trees were broken, was…"* in line 6 on page 551. We demonstrate here that the dynamic pressures calculated with eq. 16 are always too low to break trees.

P. 551, lines 10-11: it's unclear to me why you calculate the bending stress with the CPM and the SBM just for one tree.

>> The reviewer is correct. We calculated the quasi-static pressures for various trees but show the results just for one tree to exemplify the outcome. Therefore we will change this sentence to: *"We additionally calculated the bending stress with the CPM and SBM and show the result for one spruce (Fig. 6, red cross) in Table 4."*
Also we exchange *"the spruce"* with *"one spruce"* in the forth sentence in the caption of Fig. 6.

P. 551, lines 19-21: this is certainly useful information; however, it is not mentioned the number/proportion of living trees after the impact.

>> We will include the numbers in brackets behind 'broken', 'uprooted' and 'healthy'.

P. 552, lines 10-14: it would be more clear to follow the same listing order for the avalanche core and the powder cloud.

>> We will change the listing order, first powder cloud then dense core.

P. 552, lines 21-23: please indicate why the model could not simulate the levee formation.

>> To simulate levee formation we need a higher resolution elevation model; also we need very precise temperature information.

P. 553, lines 7-9: please rephrase, i.e. release height and snow entrainment are not meteorological conditions.

>> We will change this sentence to: *"The meteorological, release and entrainment conditions…"*

P. 553, lines 11-12: and how did you estimate this? did you date some dead trees?

>> Yes, the approximate age of the forests was known. Additionally information from the Bavarian avalanche cadastre was used to define the return period of these events. We will change this sentence to: *"Information from the Bavarian avalanche cadastre and forest inventories was used to define the return period of these events, which was at least 100 years."*

Table 1: in the flow regime, what comes in the intermediate line?

>> Dense is possible with dry, mixed and wet flow regime. We will include this in the table.

Figure 2: in the second line of the legend, do you mean saltation layer?

>> We will change the figure by exchanging "*saltation*" by *"intermittent"* to avoid misunderstandings.

Figure 7 and 8: please enlarge.

>> We hope enlarging is possible for the final print version.