We thank the reviewer# 2 for the review and the constructive comments! All reviewer comments (in italics) are addressed below.

Specific comments

The 11 diverse spatial, high-resolution snow depth data sets were pooled to develop an empirical parameterization for sigma snow depth. There is some discussion of how snow depth data from the sensors/platforms affect results in different sections of the paper. Can a summary of which sensor/platform provides the "best" snow depth data set resulting in a better parametrization for sigma snow depth?

To improve the σ_{HS} parameterization the most accurate platform for fine-scale spatial snow depth data acquisitions is most likely airborne laser scanning (ALS). However, as outlined by [2, 1], given that ALS is still very costly airborne digital photogrammetry is an economic alternative, in particular when performed with cost-effective unmanned airborne vehicles (UAS) [1].

While we weren't able to clearly relate some of the poorer region-wise performances to uncertainties related to the platform, other studies entirely focused on performing extensive inter-comparisons between these methods for large-scale snow depth mapping in alpine terrain. We now refer the reader to these studies in Section 5.4.3.

Done with snow depth data sets at annual maximum snow cover, how might parameterization of sigma snow depth with data sets collected at mid-season or late season of snow cover affect the results? Is there a preferred time in relation to seasonal snow cover to collect a high-resolution snow depth dataset? Is it possible to use multiple snow cover data sets collected at a site at different times during the season to parameterize sigma snow depth?

By parameterizing σ_{HS} using peak of winter snow depth data gathered in mountainous terrain, we derived a formulation of the spatial snow depth distribution at peak of winter. Since we did not have available similar detailed data sets during accumulation and melt, we did not parameterize σ_{HS} during other periods than around approximate time of peak of winter. However, since $fSCA$ is a crucial model parameter, our overall goal is to describe the $fSCA$ curve throughout a snow season. For this we needed a reliable scale-independent peak of winter σ_{HS} parameterization for mountainous terrain. Soon, we will submit our work on such a seasonal $fSCA$ algorithm. When using current snow depth in the peak of winter σ_{HS} parameterization large errors in modelled $fSCA$ resulted for instance during the ablation period. However, by tracking snow depth over the season and by accounting for alternating snow accumulation and melt events during the season, these errors decreased considerably and seasonal trends of $fSCA$ were overall well parameterized.

We rephrased the last paragraph of the conclusions to improve the seasonal $fSCA$ outlook.

Technical comments

Line 108: Suggest delete "large quantity", it is an unnecessary qualitative description of *data used.*

Done.

Line 137: The words "than for the" cause some confusion. Was the ALS data processed similar to the ASO campaigns or different from those campaigns?

The ALS data was processed similar to the ASO campaigns. We rephrased that.

Line 173: "lower zero" should be lower than 0, or snow depth $\leq$*. "above" could be changed to ¿ . And units should be given with "threshold of zero"*

Changed.

Line 228: "pearson" should be capitalized, prop noun. Applies throughout the paper.

Changed.

Line 307: The expression "strike out" would be better stated as standout.

Thanks.

Line 398: Please clarify "not origin". Possibly originate is a word that could clarify source.

You are right- we changed that.

*References

[1] Y. Bühler, M. S. Adams, R. Bösch, and A. Stoffel. Mapping snow depth in alpine terrain with unmanned aerial systems (UASs): potential and limitations. *The Cryosphere*, 10(3):1075–1088, 2016.

[2] Y. Bühler, M. Marty, L. Egli, J. Veitinger, T. Jonas, P. Thee, and C. Ginzler. Snow depth mapping in high-alpine catchments using digital photogrammetry. *Cryosphere*, 9:229–243, 2015.