

Interactive comment on “An assessment of sub snow GPS for quantification of snow water equivalent” by Ladina Steiner et al.

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Congratulations on this well-structured nice work – we followed your results with great interest. It is positive that research on submerged antennas for the derivation of snow properties is increasing – this article is a further step on this topic. The idea of using a widelane linear combination for data from geodetic receivers is interesting.

Thank you for citing our research (Henkel et al. 2018 and Koch et al. 2014). It would be great, if you could insert in your introduction that our study on GNSS SWE derivation was also conducted at the study site Weissfluhjoch. Would be interesting to compare our results in future. Maybe you can also refer to our study at the point you are describing the method that you also applied one variant estimating L1-data ambiguities

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and snow parameters in one step as we did this as well in Henkel et al.

Regarding page 5, line 23, we have one suggestion as the separation between dry and wet snow is an issue: You write that SWE can be estimated by a single water layer using the refractive index of water. This might be approx. true for wet snow. However, if the snow is dry, it would be rather a single layer of ice (e.g. compressing all snow particles to one thin ice layer) which would have a quite different refraction index (as you also demonstrated in your former paper). The different refraction would then also have an impact on the excess path length (ice vs water). Maybe you can assume an average refraction index for both cases (dry and wet snow) or just mention that this point might be a source of error and discuss the phase change from dry to wet snow a bit more in detail.

Best regards

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