

Interactive comment on “Towards the connection between snow microphysics and melting layer: Insights from multi-frequency and dual-polarization radar observations during BAECC” by Haoran Li et al.

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I found this article to be very well written, interesting, and has some significant points. I have the following comments and suggestions. They are minor and can lead to future research.

Introduction. The introduction was extremely comprehensive and useful to researchers
Page 2, line 16. Relative humidity also has a large influence on the melting of snow and therefore the melting layer.

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Page 4, line 14. This relationship is extremely similar to the one we developed from in-situ observations of particle size distributions used in concert with direct measurements of the ice water content, in conditions where the particles were mostly unrimed snow, $m=6.1\times10^{-3}D^2.05$

On Page 3, it says that "The BAECC field campaign was conducted at the University of Helsinki Hyttiälä Station from February to September 2014". On page 6, line 13, it says "for the winters of 2014-2018". On Page 16, line 10, I think I know what you mean but the sentence and field program dates need clarification.

Page 6, last paragraph. You could also use our vast in-situ data sets in widely varying conditions to develop similar relationships, in particular when the CVI direct measurements were available, to conduct a similar study. Those data are readily available. Some are collocated with direct measurements of radar reflectivity at multiple radar frequencies (e. g., OLYMPEX field program). Figure 1 could readily be repeated using these data for many different types of clouds.

Page 10, last paragraph. Can't reflectivity alone be used to look at the fraction of riming of the particles-at least to discriminate rimed from unrimed?

Page 11, line 5. 5. "is rises" to "increases"

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