

Interactive comment on “Water Content of Greenland Ice Estimated from Ground Radar and Borehole Measurements” by Joel Brown et al.

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The manuscript "Water Content of Greenland Ice Estimated from Ground Radar and Borehole Measurements" by Brown et al. presents a novel data set on EM wave velocities in temperate ice within the ablation zone of the Greenland Ice Sheet. The authors compare borehole records on temperature and total ice thickness with radar measurements. From conversion of two-way travel time (TWT) and measured depths, Brown et al. are able to calculate for velocities. Since measurements are conducted within the ablation zone, the contributing volume fractions of air and ice remain constant and are known. In consequence, it is possible to derive liquid water content. The estimated water contents for the temperate basal layer in this work exceed previous estimates applied in models. The presented results are of high interest to the scientific community and are worth publishing.

C1

In summary, this work is relevant, well-written and adequately presented, I only ask for moderate revisions. More major points I criticize are:

- The term liquid water content (lwc) is not defined in this manuscript. It is of relevance whether you describe volumetric or gravitational lwc. Since the hoisting medium is considered as ice with a density of 917 kg/m³ (which is not defined either), you only have a ~10% offset between volumetric or gravitational lwc. However, I strongly recommend to define this term.
- The title of the manuscript is quite extensive and might lead to misinterpretations. Since you only discuss a small part within the ablation zone of an outlet glacier, I suggest to reduce the title to its geographical location.
- I agree with Joseph MacGregor that Figure 4, in the current state, is not very supportive. However, the Figure already appears in a Youtube video and consequently the video and its location must be referenced or the Fig. removed. Otherwise, this is a plagiarism!
- The chapter S3 in the supplemental information is not referenced in the manuscript. However, the information within this chapter is of high relevance and should be included into the main part.
- Furthermore, I recommend to include the error analysis of the supplement into the main part as well. This section only requires little revisions but provides important information for the reader.

Minor points that should be addressed:

- Figure 1a, the red dot within the GrIS overview is hardly visible in a print out. I suggest increasing this feature or at least provide bars leading to the respective locations.
- Figure 2 the blue and yellow dashed lines are hardly recognizable. I understand that you don't want to hide radargram information by the lines but at least consider increasing the thickness of the lines or change to colors with higher contrasts.

C2

- I recommend to include Hobbs (Ice Physics) as reference in page 8 L30ff

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