Review of “Sentinel-1 Detection of Ice Slabs on the Greenland Ice Sheet”

This paper presents an investigation of the potential for detecting ice slabs in the Greenland Ice Sheet using Sentinel-1 HH and HV C-band radar backscatter data. The paper is interesting and seems to show some promise for the method. The authors provide an appropriate degree of assessment indicating the regions of most uncertainty. I believe the paper can be published after some revisions, as follows:

1) Why was 500 m resolution used? The authors never discuss this. Finer resolution would be of interest. Was there a reason it was not pursued?

2) The authors discuss their reasoning for using only 1 year of data in the paper’s conclusions. I can see their points, but the paper would be more impactful if a multi-year study were performed. I recommend at a minimum that the authors describe their reason for using only a single year earlier in the paper.

3) Bottom of p. 2: should say radiometer not radar data. 2nd paragraph of p. 3: dielectric misspelled

4) Could the authors provide more information on the residual errors after the angle correction is performed, e.g. a plot or two of the data before and after angle correction? I’m assuming there is a lot of residual here due to the highly variable topography, etc. which makes such effects also a potential source of error that could be included in later discussions.

5) Figure 2 could be more appealing if zoomed somehow in the manner of Figure 6. As is, we mostly see the interior ice sheet regions that are not of interest in this study. Perhaps rotate 90 degrees and separate into rotated images of the East and West coasts of the ice sheet?

6) Was the same angle correction used for the Summer data? If so, this should also be noted as a potential (minor) issue.

7) The apparent alignment of the contours in Figure 3 with a “45 degree line” suggests that a classifier based on sigma_HH + alpha sigma_HV where alpha is some constant might also be successful here, rather that the separate thresholds on each quantity?

8) Figure 5 appears somewhat redundant given that everything has been described in the text by this point.

9) I found the distinction between the “minimum”, “maximum”, etc. classifiers somewhat confusing. Please introduce these ideas more clearly early on in the discussion of the classifier.

10) Dashed lines in Figures 6 and 11 are hard to discern especially when the topographic lines are included. Is there a way of doing this that makes them more clear? This comparison is key so making it easy to follow is crucial.

11) Some of the discussions of differences seemed a little long and overly complex. Consider trying to simplify these discussions if possible, i.e. simply state “may have more volume scattering compared to xxx” etc.