

Response to the editor's technical corrections and suggestions to revised manuscript TC-2023-126:
Estimating differential penetration of green (532 nm) laser light over sea ice with NASA's Airborne Topographic Mapper: observations and models

Editor: Dr. Huw Horgan

We use the following color and font coding scheme in our response to aid visual distinction for readers with color vision deficiency (CVD):

Editor's comments

[Response:](#) authors' response to the editor's comments.

Dear Dr. Horgan,

Thank you for your careful review of the revised manuscript and the very helpful comments and suggestions to improve the manuscript for publication. We have uploaded a revised manuscript and revised figures, with the MS Word document containing the tracked changes. We are looking forward to seeing the paper published in The Cryosphere.

Best regards,

Michael Studinger

Response to the editor's technical corrections and suggestions for manuscript TC-2023-126

L81. 'in different in'

[Response:](#) changed "in different in" to "in different"

L249 'OIB' -> Operation Ice Bridge (OIB)

[Response:](#) changed "OIB" to "Operation IceBridge (OIB)"

L335 'are primarily resulting in pulse...' -> primarily result in the broadening of the pulse tail.

[Response:](#) changed "are primarily resulting in pulse broadening" to "primarily result in the broadening of the pulse tail"

L341 'need to be' -> are

Response: changed "need to be" in now line 340 to "are"

L354 'as reference time' -> as reference times

Response: changed "as reference time" to "as reference times" in line 353

L357 'will be refracted away' -> will be reflected away

Response: changed "refracted" to "reflected"

L550 suggest removing semicolon. -> ...reduce scattering). In ice, a longer...

Response: We have removed the semicolon in now line 549 and started a new sentence as suggested.

L575 (and elsewhere) 'angle of incident' -> angle of incidence

Response: We thank the editor for catching this classic lidar paper mistake. We have searched the manuscript and are embarrassed to have found three occurrences of "angle of incident". We have replaced all three with "angle of incidence" (now lines 386, 575, and 593).

L650 'The location of the selected area is shown in Fig. 13.' suggest moving to Fig 10 figure caption to resolve out of order figure referencing.

Response: We were aware of the issue of out of order figure referencing and thank the editor for his suggestion that resolves the issue. We have moved the sentence from line 557 to the caption of Fig. 10 as suggested.

L768 'allows to' -> allows us to

Response: changed "allows to" to "allows us to" in now line 767

L769 'as reference elevation' -> as the reference elevation

Response: changed "as reference elevation" in now line 768 to "as the reference elevation"

Figure 1. shift text 'thin-ice' currently obscured

Response: Thank you for pointing this out. During manuscript preparation, we changed the color palette to a CVD-friendly blue-white-red diverging color palette, which made it difficult to read labels in white font plotted over the white colors in the center values of the color palette. We have moved the entire "multi-layer thin-ice" label into the dark, gray sea ice and open water area outside the lidar footprints, which makes it much easier to read.

Figure 3. Caption 'broken out in different surface types that are' -> where different surface types are

Response: The above phrase is in the main text (now in line 313). We have changed it to "where different surface types are" as suggested.

Figure 7. Caption. Suggest you include in caption ‘Elevations are referenced to the WGS84 ellipsoid to enable assessment of the changing open water elevation between passes.’ or similar wording.

Response: This is an excellent point that will help the readers to better understand this figure. We have added the suggested sentence to the caption of Fig. 7.

Figure 8a. Annotation font color in lake very hard to see (same in Fig. A4)

Response: We have changed the font color of the labels over the melt pond in Fig. 8a and Fig. A4a from black to white to increase contrast and separation between the labels and the dark blue melt pond area. We have also added a black outline to the white label characters to improve readability.

Figure 11. Caption. ‘angle of incident’.

Response: changed yet another occurrence of “angle of incident” to “angle of incidence”

Figure 11. Caption. ‘100-500 mm’ should be micro-m?

Response: Thank you for catching that. We have corrected the units to μm .

Figure 11. Caption. h_{bias} -> (h_{bias})

Response: We have put h_{bias} in parentheses as suggested.

Figure A1, A3-A5 please repeat figure captions.

Response: We have replaced sentences like “For figure caption see Fig. X.” with text from the respective figure captions from the main text for the above four figures in the appendix.

We have noticed that the first sentence in the caption of Fig. 8 was garbled and have corrected the problem: “Natural-color (RGB) imagery with lidar elevation me ATM6AT5 measurements...” changed to “Natural-color (RGB) imagery with ATM6AT5 lidar elevation measurements...”