

Editor decision: Publish subject to technical corrections

by [Joseph MacGregor](#)

Public justification (visible to the public if the article is accepted and published):

Dear Dr. Franke et al.,

Thanks for submitting your revised MS on AWI radar data. It clearly includes satisfactory responses to all reviewer comments and my own. I'm very happy to accept this valuable work to TC. After re-reading it all, I have identified one location where additional information would be valuable and spotted a few minor typos. See below. Please address these as possible prior to copyediting. Thanks for undertaking this critical effort for the radioglaciological and related communities, and congratulations on its impending publication.

Dear Joe MacGregor, thank you once more for taking the time and consideration for our article. We believe that the additional points raised are important and will make the manuscript clearer and more comprehensive. Our detailed responses are listed below in blue.

Nex to these improvements, we've added a few minor things to the article as, e.g., important literature that we have either overlooked or just came out as well an improvement on the data availability statement. These changes are listed and the end of this document.

Section 5.7: It may be worth briefly clarifying in this section that comparable inferences of crustal and geological variability for the Arctic were not made because gravity and magnetic measurements were not typically made during Arctic campaigns, perhaps referencing Table A4.

Good idea. We added some content and created a new first paragraph of this section:

“AWI airborne radar data play an important role in a number of studies of large-scale geological variability and tectonic structure in Antarctica (e.g., Ruppel et al., 2018). Given that additional geophysical instruments, such as magnetometers and gravimeters, have been used less frequently in Greenland campaigns alongside radar systems (Figures A3 and A4), this section will primarily focus on scientific findings from Antarctic campaigns. However, magnetic surveys were conducted in Greenland alongside AWI EMR measurements between 1997 and 2004 (e.g., Mayer et al, 1999), with data available in compilations such as the Greenland Magnetic Map (GREENMAG; Heincke et al., 2025).”

Tables A3 and A4: “Laserscanner” is better termed “lidar” or “laser altimeter”. More importantly, unless this information is already compiled elsewhere in a publication (cite if so), it would be helpful to specify which model of each non-radar instrument was used rather than simply denote their availability with an “X”. No detailed specifications need to be given for them, but presumably these instruments have also evolved over time and researchers interested in multi-instrument synthesis could benefit. This request seems justified since the MS specifically calls out the value of such syntheses in both results and future directions. Further, given that a specific nadir camera system is mentioned in future directions, an additional column might also be considered that highlights when a “science-quality” camera system was deployed.

Good point and we agree that there is value in specifying instrument name/company and version if available. Regarding the terms LIDAR, laser altimeter and laser scanner, we would like to highlight that they are not equivalent. For us, a laser altimeter would scan the nadir distance between aircraft and surface at a single point, and a laser scanner can perform measurements at multiple angles providing a swath along the flight trajectory. LIDAR would be the overarching method for both systems. However, we acknowledge that our approach so far here has not been thorough. Starting in 1997, a laser altimeter was used, which was replaced by a laser scanner in 2012. In the table, we collectively refer to both systems as 'LiDAR'.

We have added the respective instruments for gravimetry and magnetics and for laser scanners.

Table A4: Title copied over from A3 but Antarctic but should be Arctic

Thanks for spotting this.

226: for “fk migration”, the “fk” is often stylized in most other studies that reference this processing method as $f-k$ in LaTeX syntax.

Done. Just as a side note, using $f-k$ in math-mode gives:

Toolbox; Open Polar Radar, 2023). The main steps comprise motion compensation, pulse compression, synthetic aperture radar (SAR) focusing and array processing. The SAR processing is based on the $f-k$ (frequency–wavenumber) migration technique for layered sediment packages (Gazdag, 1978), which was adapted for radioglaciology (Leuschen et al., 2000). GPS

Hence, we used “ $f-k$ ” in the regular mode.

Table A2: Hiawatha misspelled as Hiawata for ARK 2026 Survey Region

Done.

Additional minor additions or modifications:

- L354: Added the overlooked ref. Dreier et al. (2025)
- L380: Added ref. Paxman et al. (2026)
- L580-L583: Added the overlooked ref. Mohammadi-Aragh et al (2025) and some context
- L 692-693, Section 7: Added a reference to the Jupyter Notebook, which we forgot to do in the revision.
“A sample Python Jupyter Notebook with code for loading and plotting AWI radar NetCDF files is available as supplementary material to this article.”
- L755 – 771: We made a modification in Section 7.3 (Data usage requirements) and added an example text on how to reference AWI radar data.
- L774: Added Holschuh et al (2026) – Nature Geoscience article.
- We revised the profile-km numbers for the individual surveys. The numbers changed due to the following reasons:
 - Reprocessing of older campaigns as well as of ACCU, SNOW and UWBM data now show mostly more data compared to the earlier state
 - We removed test flights over open water
- For the statement with respect to the sum of profile-km collected by AWI, we changed the phrase to “more than one million profile kilometers”. Before it was ~ 1.6 million. This number was reduced because we left out ASIRAS data as it was mostly acquired during non-AWI campaigns. Moreover, the expression 'over a million profile kilometers' is more understandable and easier to relate to.

References

Dreier, M., Koch, M., Gourmelon, N., Blindow, N., Steinhage, D., Wu, F., Seehaus, T., Braun, M., Maier, A., and Christlein, V.: IceAnatomy: a benchmark dataset and methodology for automatic ice boundary extraction from radio-echo sounding data, *The Cryosphere*, 19, 5337-5359, <https://doi.org/10.5194/tc-19-5337-2025>, 2025

Holschuh, N., Christianson, K., Dienstfrey, W., Hills, B., Hoffman, A. O., Paden, J., Winter, K., and Zuraw, R.: Entrained debris records regrowth of the Greenland Ice Sheet after the last interglacial, *Nature Geoscience*, pp. 1–8, <https://doi.org/10.1038/s41561-026-01950-1>, 2026a.

Mohammadi-Aragh, M., Zeising, O., Reinert, M., Klingbeil, K., Humbert, A., McPherson, R., Morlighem, M., Timmermann, R., Wekerle, C., and Burchard, H.: Impact of Ice Topography, Basal Channels and Subglacial Discharge on Basal Melting Under the Floating Ice Tongue of 79N Glacier, Northeast Greenland, *Journal of Advances in Modeling Earth Systems*, 17, <https://doi.org/10.1029/2024ms004735>, 2025

Paxman, G. J. G., Jordan, T. A., Bentley, M. J., Small, D., Jamieson, S. S. R., and Steinhage, D.: Subglacial Topography of Coats Land Records Post-Gondwanan Landscape Evolution and Early Ice-Sheet Behavior in East Antarctica, *Journal of Geophysical Research: Earth Surface*, 131, <https://doi.org/10.1029/2025jf008590>, 2026.