

***Interactive comment on* “Brief Communication: New radar constraints support presence of ice older than 1.5 Ma at Little Dome C” by David A. Lilien et al.**

Joseph MacGregor (Editor)

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Received and published: 2 February 2021

Hi Dr. Lilien et al.,

I’ve now received effectively three reviews of your Brief Communication submission. These are mostly positive and highlight the value of your contribution and the context within the broader Oldest Ice effort and other studies in the region.

In general, I agree with their comments, and find this submission responsive to the spirit of TC Brief Communication. I am in particular concurrence with reviewer #1’s comment on 4.2 being more methods than discussion (so consider moving part of it),

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reviewer #1 and #2's concern over the terms used to describe subglacial lakes, and #3's concern over the nature of the depth-age model used (not sure it needs to be changed necessarily, but context suggested by reviewer #3 is relevant). As is probably not surprising given my Greenland studies, I am somewhat more comfortable with the matching of discontinuous reflections than a couple of the reviewers. However, given that this study is effectively centered around a single radargram, a couple of zoom-ins on the deep ends of near each core, appended to Figure 2 could help make the case based on reflectivity patterns that they are indeed the same.

Several referees suggested additional citations, many of which seem appropriate, but this leads to a broader challenge with the nature of the Brief Discussion format, which is intended to limit length and has several specific metrics, including number of references:

https://www.the-cryosphere.net/about/manuscript_types.html

It is apparently my responsibility to enforce compliance with these metrics. I ask that you not exceed any metric for a TC Brief Communication by more than ~25%, and to not add any figures. In particular, this will require you to be parsimonious with references (24 in original submission). Given many of the suggestions seem sensible, this may require reducing existing ones. "(e.g., X)" is often fine instead "(X, Y, Z)".

Below are a few comments I noted during my re-reading of the MS:

- Define LDC acronym. - 39: IceBridge - 42: R. Mulvaney is a co-author, so this citation is a bit odd. Is there a conference abstract that could be referenced instead?
- 93: "depth gradient of age following Winter et al." seems simpler and still correct
- 95: "34 ka at depth"...what "depth" in this context?
- 95: Precisely which components of the age uncertainty are meant here? Also, are they vertically or horizontally correlated? The latter seems a safe assumption, but perhaps the former is what the authors are intending to highlight?
- 103: Here it would be helpful to highlight the fraction of ice thickness that 2565/2764 represents, because frankly it is an impressive number

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compared to most radargrams. 103: "event" is evocative but confusing in this context (fast-time? a particularly paleoclimatic transition?). Better would be "reflector" IMO. - Figure 2: I highly recommend converting tedious captions into legends whenever possible, and that seems worthwhile here. - Copernicus formatting uses the abbreviation "Sect." for "Section". <https://www.the-cryosphere.net/submission.html>

Regards,

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Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2020-345>, 2020.

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