

Interactive comment on “Geothermal heat flow in Antarctica: current and future directions” by Alex Burton-Johnson et al.

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Dear John Goodge, Thank you for taking the time to provide comments on our manuscript. Whilst these were largely structural, we agree that they will make a large improvement to the coherence of the manuscript in light of its length and the diversity of work included. Our comments are provided below alongside your review. All the best,

Dr Alex Burton-Johnson

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J. Goodge jgoodge@d.umn.edu Received and published: 25 March 2020

Nice paper and worthwhile compilation of ideas as well as a look forward. I have a few suggestions, mainly to help improve organization of topics. I wonder about the overall organization of section 4.6, which is about how we make GHF estimates in heterogeneous crust. The opening section 4.6.1 goes into determining heat production from rock samples obtained from exposure, but does not discuss interpretations of GHF offered in these papers. On the other hand, GHF is discussed in sections 4.6.3 and 4.6.4, building on other ways to get at heat production. Seems perhaps better to comment on the implications for GHF from the heat production studies and how this reflects heterogeneities?

- The implications of the studies are now included as a new paragraph at the end of Section 4.6.1.

Further, I understand the distinction between rock outcrop and sampling rocks from moraines, but I wonder if it would make more sense to move up the discussion of glacial moraine materials from the CTM either into section 4.6.1 or perhaps changing that clast section to follow the other as new section 4.6.2? They both relate to determining heat production in rocks.

- Paragraph moved to follow the section on HPE measurement from bedrock.

Also, I suggest changing the title of section 4.6.4 from 'Detrital material' to 'Glacially-derived rock clasts' or something along those lines. For better or worse, 'detrital material' to many people will conjure up detrital minerals from sedimentary deposits or sedimentary rocks, or even sediment itself. In this case, it's an important distinction because we sampled large rock clasts that can be treated analytically just like any rock samples taken from exposure.

- Reworded as suggested.

John Goodge

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Please also note the supplement to this comment:
<https://tc.copernicus.org/preprints/tc-2020-59/tc-2020-59-AC1-supplement.pdf>

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2020-59>, 2020.

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