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The Cryosphere Discussions

Interactive comment on "DeepBedMap: Using a deep neural network to better resolve the bed topography of Antarctica" *by* Wei Ji Leong et al.

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I very much enjoyed looking at this paper. Using neural networks (and ai) to better depict the shape of the Antarctic bed is a great idea, and I applaud this effort.

The authors have done a good job in describing their work, and its potential significance, and I think it should be published in the Cryosphere with some moderate changes first necessary.

I like that this paper represents a new approach to studying the bed landscape in Antarctica and for that reason it should be a valuable asset for future work.

There are a few ways it can be improved, however - and I note my comments in the attached pdf.

Specifically, I'd like to see: 1. some discussion on the fact that Deepbed seems to be rougher than the base data. 2. how roughness anisotropy is captured, as this is known to occur and should be critical to more accurate modelling. 3. how bed geology influences the roughness. 4. that there appear to be major gaps and to emphasize that radar is the only tool for solving this. 5. importantly, that the approach could be better trained by working on formerly glaciated beds, such as the Laurentide ice sheet - or any land surface. Why not demonstrate the utility of the model in this way??

That said, much of these issues can be addressed in future work. I still think this is a good piece of work and look forward to seeing the modified version.

Please also note the supplement to this comment:
https://www.the-cryosphere-discuss.net/tc-2020-74/tc-2020-74-RC1-supplement.pdf

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