

The Cryosphere Discuss., referee comment RC4
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Comment on tc-2022-100

Paul Anker (Referee)

Referee comment on "Brief communication: New sonde to unravel the mystery of polar subglacial lakes" by Youhong Sun et al., The Cryosphere Discuss.,
<https://doi.org/10.5194/tc-2022-100-RC4>, 2022

Summary

This paper is a good general summary of the progress made of a novel sonde instrument, its current capabilities and recent successes in field testing. It is great to see progress being made in this direction with due consideration of the unique aspects of subglacial lake access.

Page 2

The methods section is a little confusing as it is largely written in the past tense following an idealised deployment.

Maybe a more detailed and more heavily annotated diagram of the deployment and recovery process could replace much of the more prosaic descriptions of the deployment? Personally I would like to see a diagram of the instrument itself, similar to that found in the associated paper on electrical

Page 3

Line 69: Paragraph above this point should be in the introduction

Line 72: What mechanism is actually used, is it anything like a spider climbing?

Line 76: How closely to deployment was sterilisation carried out? Was there any sampling of sonde surfaces before and after deployment to verify cleanliness? Any background measurements of the camp/snow to help identify potential sources of contamination?

Line 82: Was the system left entirely unsupervised? What was the reasoning behind this? Was there remote real time monitoring available? Is there redundancy in the system to manage problems if they occur i.e. power downs?

Line 85: Where is 'mainland'? Jilin or still in Antarctica?

Line 86: What sort of control does this allow? Real time access or a subset of data transmitted periodically?

Line 87: Be more explicit that a subglacial lake wasn't actually entered during this test. Or am I wrong and you did actually enter a lake at 200m?!

Line 88: Was this data internally logged and/or returned to the surface? What proportion of data collected was returned to the surface?

Line 91: Some detail of how the spooling works might be nice here, if not covered earlier in the paper

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Line 106: Some examples of the preparations that are specific to this instrument would be interesting here

Line 110: How was the base of the ice stream recognised by the sonde?

Line 111: Was the sampling system triggered automatically or manually?

Line 113: How does the lay up of the cable on the spool work? How is it monitored? Is the top of the sonde identical to the bottom? Does the cable penetration through the heated tip have any effect on melting on recovery to the surface?

Line 116: Any knowledge of the temperature profile through the ice column? Can a temperature profile be recovered from the probes' measurements?

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Line 134: I know this is for future work, but I would be interested to know if there are plans to protect the hose and instrument cable from tangling together whilst hot water reaming 2400m+ borehole.