

The Cryosphere Discuss., community comment CC1
<https://doi.org/10.5194/tc-2022-100-CC1>, 2022
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Reply on RC3

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Community 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-CC1>, 2022

The manuscript provides an interesting and well-done summary about a the novel melting probe concept (RECAS) developed by the authors and its field test results in 2022 in Antarctica.

Thank you for your interest shown to our research.

The devices of others are "probes" but your device is a "sonde". What is the difference that justifies another name?

There are no any specific differences between "probe" and "sonde" in terms of freezing-in hot-point drills. We agree that the most common is the term "probe". However the term "sonde" can also be found. For example, Morton and Lightfoot (1975) alternatively used terms *meltsonde probe*, *meltsonde*, *sonde*, and *probe* to describe the concept of freezing-in hot-point drill designed by Australian Antarctic Division. From the very beginning, our drill was denoted as the sonde.

Morton BR, Lightfoot RM (1975) A prototype meltsonde probe-design and experience. Australian Antarctic Division, Department of Science, Tech Note No 14

On page 5, in the discussion of later extraterrestrial deployments, the authors should state that the current dimensions, mass, and power consumption may be problematic and miniaturisation may be an issue ... and, well, the diesel generator will not work :)

The words in line 138-139 "*Successful RECAS tests give the good example on how extraterrestrial probes can be back in safely and reliable manner*" will be changed in the revised version of the paper as "*Successful RECAS tests give the good example on how extraterrestrial probes can be back in safely and reliable manner, although RECAS sonde cannot be applied in extraterrestrial bodies directly.*"

The English is understandable but could be improved.

We will improve English in the revised version of the paper.

Page 2: "Russian team" => "a Russian team", "UK team" => "a UK team". (Dozens of "a"s and "the"s are missing in the manuscript, but they will hopefully be inserted during the generation of the proof.)

We will carefully check and improve English grammar and style in the revised version of the paper.

Page 3: The Philberth-type probe was proposed in "(1976)"? It reached 1005 m in 1968? So it was proposed before 1968 and maybe the original paper, in which it was proposed, should be cited instead.

That is the common way of citation. It does not mean that the Philberth-type probe was proposed in 1976. It means that Philberth's paper was published in 1976.

Page 3, "move in the borehole using inner cable recoiling mechanism on the same way as a spider climbs on the silk line": Well, I'm not an arachnologist, but I'm quite sure that spiders do not have such a device :) So it may be better to write "move in the borehole using an inner cable recoiling mechanism similar to a spider climbing on the silk line"

We will change the words in the revised version of the paper as suggested.

Page 3: The changes between "the team", "we", "research personnel", "ourselves" is a bit confusing. Are they different people? Could be harmonised.

These words will be unified in the revised version.

Page 3, line 85: "send" => "sent"

We will change it in the revised version of the paper as suggested.

Page 4, "Even the site demonstrates cold-based condition ...": I don't understand this sentence.

The initial idea was to find a site with a subglacial water system near Zhongshan Station for field testing. However, due to the impact of the COVID-19 and the overall task arrangement of the CHINARE, detailed radar topographic mapping and route exploration were not possible. Therefore, the blue ice area on the flank of the Dǎlk Glacier was chosen as test site, where the bedrock coring drill had been tested during the 2018/2019 season. Even there is no subglacial water under the ice sheet in the chosen site, we believe that the overlying 200 m ice is thick enough to verify the drilling/sampling functions of the RECAS sonde.

Page 4: When the test hole was started on January 18, why was the field test 2021–2022?

We will change the words "in 2021-2022" to "in 2021-2022 season".

Page 5, "... can be back in safely and reliable manner": Better: "can be returned to the surface in a safe and reliable manner."

We will change the words in the revised version of the paper as suggested.

Please also note the supplement to this comment:

<https://tc.copernicus.org/preprints/tc-2022-100/tc-2022-100-CC1-supplement.pdf>