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Comment on gi-2022-4

Alex Brisbane (Referee)

Referee comment on "Towards a self-sufficient mobile broadband seismological recording system for year-round operation in Antarctica" by Alfons Eckstaller et al., Geosci. Instrum. Method. Data Syst. Discuss., <https://doi.org/10.5194/gi-2022-4-RC1>, 2022

Review of "A self-sufficient mobile broadband seismological recording system for year-round operation in Antarctica" by A. Eckstaller et al., 2022, Geoscientific Instrumentation

Alex Brisbane, April 2022

Eckstaller et al. present an overview of their mobile seismic station system for use in the polar regions. The group have developed a relatively lightweight and mobile system for use in a modular manner with different seismic and recording systems. The manuscript covers concepts, requirements and solutions.

The paper is well written and easy to follow. It provides a lot of useful ideas and concepts which practitioners embarking on similar deployments will find useful to be highlighted prior to starting such projects and therefore forms a useful piece of work.

Major comments

The system has a lot of similarities with the IRIS Passcal system used for the Polenet Project which has become the standard for many deployments in Antarctica. However, it takes until the acknowledgements for this to be recognised. In addition, there is little mention in the introduction of Polenet or IRIS. For example, all the white circles on Fig. 1a are Polenet stations and the authors do a disservice to the work of these groups to have achieved the station coverage of West Antarctica that Figure 1 highlights. I would suggest a paragraph in the introduction covering: The IRIS Passcal system; the relationship between this system and the IRIS Passcal system and why the concept presented here I needed; the achievements of the Polenet project. Again, in section 4, I suspect that IRIS

Passcal now have some impressive year-round data recovery rates. I would like to see these mentioned for comparison and perhaps some comments on how this work advances that of Passcal.

I feel that there are details missing that would make this a much more useful paper. A number of the statements are subjective. I would like to see a table of specifications for components listing power draw and weight for example and a way of understanding the relative power-cost of individual components (sensor and data logger are reported), such as the XEOS or Solar controller. How about example overall station weight/volume etc.

The title including "year-round" may be a stretch as it seems that this concept has yet to be fully established for year-round recording. Maybe that's why the word operation is used? Perhaps a little disingenuous.

In many ways the manuscript leaves a lot of questions unanswered, mostly being why did the developers use this controller or that modem? Were other systems tested and ruled out? You could save future practitioners some effort by stating why these units were used over others (not necessarily having to publish manufacturer's names).

Minor comments

- 2 and elsewhere – 3k seismometer – do you mean 3-Component?
- Table 1 – I am not sure I would call the table or column 2 "Instrument specifications", it is more the model numbers. I do however feel that at some stage (probably in the appendix) more detailed specifications would be welcome, such as temperature rating, power draw etc).
- L108 – What is the power drain of the Morningstar 15L?
- L110 – Likewise, what is the power requirement of the XEOS over a season?
- L122 – can you quantify "high winds"?
- L159 – not sure what "into the drilling hole" means
- L173 – good to quote power drain in Ah or Ah/day
- L174 – it would be good to know how the overall power budget is distributed amongst the components.
- L194 – Again, IRIS Passcal have addressed and solved this issue in one way but it isn't mentioned.
- L227 – another issue that could be highlighted is that wind strengths are highly variable spatially and in my experience the manufacturing tolerance of wind generators tends to be poorly managed so two adjacent supposedly identical units can respond differently to wind strength. Do the authors have any experience of this that could be included?
- L245 – do you mean discharging rather than charging?