

Solid Earth Discuss., referee comment RC1
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Comment on se-2021-63

Ryan Schultz (Referee)

Referee comment on "Dynamic motion monitoring of a 3.6 km long steel rod in a borehole during cold-water injection with distributed fiber-optic sensing" by Martin P. Lipus et al., Solid Earth Discuss., <https://doi.org/10.5194/se-2021-63-RC1>, 2021

Review of Solid Earth article MS# 2021-63,

The manuscript of Lipus et al., "Dynamic motion monitoring of a 3.6 km long steel rod in a borehole during cold-water injection with distributed fiber-optic sensing" is an article concerning the observation of thermally induced stick-slip events. Cold water pumped into a well causes the rod inserted into the well to contract, with shaking from the stick-slip events recorded on DAS. The results are compared against DAS and DTS data to build a picture of where and why these events are occurring in the well. I think that the results of the paper could be interesting the readership of Solid Earth.

For this paper, I have only a few small critiques that should be addressed before acceptance with Solid Earth. In general, my comments revolve around better explaining some of the arguments the authors are trying to make. A more detailed list of my thoughts follows below:

- In the conclusion, the acronym FO is used for the first time. I'm assuming it means fibre optic. I'd recommend removing it, as it's only ever listed here.
- From the results of this paper, it should be possible to get a rough estimate of what the coefficient of friction is between the well and the rod. Would be interesting to get a back-of-the-envelope sense of what that value is.
- In Section 4.1 the authors talk a bit about errors that apply in the measured and expected strains. I'm curious as to what sorts of errors could be introduced from the DAS data based on the response spectrum of the fibre optic cable. Are we potentially attenuating frequencies that could contribute significantly to the measured strain?
- The following page lists minor corrections and typos to be fixed.

Thanks,

-Ryan

Near Lines 372 & 377 & elsewhere: "extend" should be "extent"

Figure 9: Why do events only seem to occur at the top of the casing liner after ~16 minutes?