Reviewer comments on "Failure strength of glacier ice inferred from Greenland crevasses" by Grinsted et al.

This is an excellent paper, addressing an under-studied but important issue in glaciology in an elegant and rigorous manner. The methods and results are presented efficiently and clearly, with enough detail to address the important issues but without clutter or un-necessary material. It is pleasing to see such clear patterns emerge from the data, despite the many potential issues with data resolution.

My only substantial criticism is that the crevasse onset criteria should also be presented in terms of strain rates, rather than stress metrics alone. As the authors clearly state, the calculated stresses depend on the choice of rheology. Standard values have been used, and the prefactor *A* has been scaled to temperature; this is all good, and aligns with standard practice in glaciology. However, major sources of uncertainty remain, including the true temperatures at crevasse-initiation depth, non-temperature influences on *A*, and the possibility (indeed, likelihood) of varying *n* across the very large study area. For these reasons, the calculated stresses are not absolute, but parameter-dependent. The authors have done an excellent job of highlighting these issues in the text, and I have no issue with that. However, it would be very useful to present the raw strain rate values – these are the *observations*, and are hence free from any assumptions regarding the rheology. Including the strain rate data will offer researchers greater flexibility in how they interpret and use the results presented in this paper. I do not see any need to adjust what is already written in the paper, simply to add a section (and a Figure) on the strain rates.

I found only one typo. On line 82, one 'principle' sneaked into the text. As is the case elsewhere in the paper, this should of course be 'principal'.

The author team are to be congratulated on a fine study. The paper is likely to be widely cited: I shall certainly find it very useful for my work on the role of crevasses in calving.

Doug Benn