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Interactive comment on "A temperature- and stress-controlled failure criterion for ice-filled permafrost rock joints" *by* Philipp Mamot et al.

Philipp Mamot et al.

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Dear referee,

We thank the referee for her positive feedback, the constructive comments and valuable hints to further publications connected to our work. We addressed all comments and changed the manuscript accordingly.

The improvements in the revised manuscript addressing the main points of criticism are summed up as follows: (i) The applied small rock surface roughness is a compromise between both requirements: a good sample-reproducibility in terms of uniform test conditions (without spending too much time and costs) and a simulation of rock surfaces as close as possible to conditions in the field. In future we consider to perform more

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Discussion paper

tests on varying surface roughness, but this is beyond the scope of this first study. (ii) We added a detailed discussion on the assumption that the influence of the rock type is less important for the shear strength of ice-filled joints. Here, we considered properties like the thermal conductivity, the porosity, the type and strength of the constitutive minerals as well as thermal strain. (iii) We modified our model on the unloading of an underlying frozen rock mass, we added a figure and gave more information on how the approach works.

All detailed changes are listed in the uploaded *.pdf-file.

Philipp Mamot and co-authors

Please also note the supplement to this comment:
https://www.the-cryosphere-discuss.net/tc-2018-57/tc-2018-57-AC2-supplement.pdf

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