

The Cryosphere Discuss., referee comment RC2  
<https://doi.org/10.5194/tc-2022-155-RC2>, 2022  
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## **Comment on tc-2022-155**

Anonymous Referee #2

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Referee comment on "The temperature-dependent shear strength of ice-filled joints in rock mass considering the effect of joint roughness, opening and shear rates" by Shibing Huang et al., The Cryosphere Discuss., <https://doi.org/10.5194/tc-2022-155-RC2>, 2022

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The author conducted shear tests on a large amount of ice-filled rock joints. The study seems interesting and solid. Some explanations should be given before it could be published. The following comments are for consideration.

Very few results have been included in the abstract part. Move L14-15 to the introduction part. The abstract should be concise and include the main results of this study.

L19-20, "when the joint opening is large enough", what is the threshold in terms of joint opening in this study?

L84, the meaning of the symbols can be included in the table.

In preparing the samples, the line roughness profile is simply extended to a surface roughness profile. Therefore, the authors should clarify the shearing direction in terms of the profile.

L150, it is suggested to provide the corresponding references.

L151, avoid to use "law" for describing the changes. In addition, "as shown in Fig. 5" should be "show in Fig. 5" or ", as shown in Fig. 5". It is suggested to double check the English carefully.

In Fig. 5, present the shear direction in the photos. In addition, the aggregation of rupture ice is not clearly seen from these photos. How is it determined?

In Fig. 6, please clarify the definition or the standards for "noticeable bulge" in detail.

In Fig. 7, how is the aggregation of rupture ice experimentally determined? Please provide methods and details. In addition, is the data point a mean value of the three samples?

L194, provide references.

In my opinion, the shear rate range is quite small. This is why the shear strength experiences neglectable change. The explanations in L242-254 are less convincing. Therefore, please give the exact shear rate adopted in the references when discussing the ductile to brittle transitions.

L267-271, does it mean that the joint surface was not fully filled by ice when  $d=2\text{mm}$ ?

In Figs. 13 and 14, it is better to adopt the joint opening as the horizontal axis for evaluating the effect of joint opening.