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Interactive comment on "Control of pre-existing fabric in fracture formation, reactivation and vein emplacement under variable fluid pressure conditions: An example from Archean Greenstone belt, India" *by* Sreyashi Bhowmick and Tridib Kumar Mondal

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Dear authors,

Thank you for your work on the manuscript, which improves it. However, I see important unresolved points that you have to consider carefully before the paper can be accepted. Then please answer carefully to these specific points and give the lines where you clearly provide your new explanations and revisions in the manuscript.

1 - Please remove the new text about KIC, which is inapropriate to the study case. First this rationale implies too much speculation about the initial crack length, which is not observed or at least not presented. Second, you try to estimate the stress with a LEFM equation in which you have two unknowns (Y and S3). Third, you give phenocryst size to define a potential length of initial crack (which is very speculative) to use this equation which is for homogeneous elastic properties. In you rationale, the crack length is controlled by the penocrist and host heterogeneity and therfore not controlled by the elastic stresses. Then the rational is not suitable.

You can let the following text and mention briefly how S3 has been estimated if the estimation is proper (LOT ?): Âń It may also be noted that, previous studies by Mondal and Acharyya, 2018, conducted in Chitradurga Granite, in close vicinity of the study area also regarded the magnitude of $\sigma 3 \sim 10$ MPa, to be a good estimation. Combining these estimations with the results obtained from the present studies, we constrained the value for $\sigma 3 \sim 12$MPa. Âż

2 - Please clearly answer to the following reviewer#2 main comment that you have not considered in your revision: Reviewer #2 mentionned : Âń In page 14 (lines 273-274), it is mentioned: "Tensile strength of metabasalt (âĹij12MPa; obtained from BTS studies) indicates that the minimum principal stress (sigma3)has to be sigma3$\geq$12 MPa." Thereafter, this value is selected as magnitude for theminimum principal stress for the stress reconstructions (e.g. Fig. 7). I am particularly puzzled by the reasoning. The condition for tensile fracturing is sigma3 – pore pressureless or equal to the negative value of tensile strength. That is if sigma3 = 12 MPa thenPf has to be equal or higher than 24 MPa... Starting from there could the authorsexplain how they constrain sigma3? Âż

I completely agree with reviewer 2, there is again a problem of rationale, or unclear/incomplete explanation. First, I do not understand how you use the BTS to estimate the minimum principal stress. The BTS gives you an estimate of the strength (a negative stress value) but this value alone can not give you the full minimum principal stress (Sigma 3, which must be positive at depth). Then BTS gives you T0 = -12 MPa. If you manage to estimate S3 (how ?) as equal to 12 MPa (then positive), then Pf must be higher or equal to S3+(-T0), then 24 MPa as suggested by the reviewer.

3 - You mention Âń CORRECTED and INCORPORATED the suggestion Âż for the following comment I mentionned: Âń Provide more justification in the discussion about the deformation mechanism related to the magnetic fabric. Can we interpret the magnetic fabric as non-coaxial (simple shear) or multi episodic deformation (2 poles on the stereogram), and then having a shortening oblique to the foliation ? Âż Please, clearly indicate in which lines you did the explanation, I do not find dit in the Ms.

4 - The wing crack geometry has not been corrected in the block diagrams of the last figure although you mention that you did the revision. The wing crack geometry you drawn is still kinematically inconsistent with the sense of shear on the reactivated veins in the three schemes and at different places in a same sheme. The wing cracks you drawn around the reactivated veins suggest right lateral shear, which is inconsistent with the far field stress. Please revise the wing crack position in all the diagrams to adapt them to sinistral shear on the slipped veins, and to be consistent with the remote stresses.

Best regards, Roger Soliva

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