This manuscript is an important contribution to a topic of considerable interest within geoscience. Fracture length distributions are important for rock strength and permeability, and thus are of great practical interest. Although length distributions from field studies are widely used inputs for modeling, there has long been uncertainty about how best to measure and analyze the outcrop observations.

There are in my opinion a couple of places in the MS where some clarifications will help improve the impact of the contribution. One of these areas is in contextualizing the work in the Introduction (see comments for lines 81, 106). The other is the at the beginning and in the transitions between the explanation of the survival analysis (see line 129 comment). There are also a couple of minor usage issues; I've highlighted some. The comments are keyed to lines in the text.

81 I suggest making this comment more nuanced and adding a reference: 'joints when empty or veins when filled (refs), although many fractures have hybrid fill attributes: they may be partly filled with inconspicuous mineral deposits that resemble joints, or the degree of fill may depend on fracture width, so that small fractures resemble veins (e.g. Laubach et al., 2019).' After all, many fractures of interest to subsurface applications are strictly speaking neither 'joints' nor 'veins'. In some populations small fractures are fill but wide fractures are open with a thin mineral lining. The old joints versus veins terminology is not helpful, and this is particularly germane for the discussion of length since 'open' fracture length may depend on these width-dependent mineral infills. It's better to call them 'opening-mode fractures or faults' and separately specify the fill state. Laubach, S.E., Lander, R.H., Criscenti, L.J., et al., 2019. The role of chemistry in fracture pattern development and opportunities to advance interpretations of geological materials. Reviews of Geophysics, 57 (3), 1065-1111. doi:10.1029/2019RG000671.

90 The ambiguity of lengths where, as is the common case, fractures are segmented and en echelon, ought to be mentioned. This is a big source of uncertainty in measured lengths (and heights) and there are now ways to deal with this rationally with other node types. See the Forstner paper.

106 Here the potential for flow in the fracture network is assumed to be a function of connectivity, but in the preceding list of fracture types many of the elements many not be conducive of fluid flow, for example some faults with gouge and opening-mode fractures that are sealed. Likewise, if you have a situation where sets are of different ages, early sets may be sealed (or partly sealed) and later ones more open. An example is an outcrop of veins abutted or crossed by later joints. These abutting and crossing relations may impart high connectivity but will have a different impact on flow than a bunch of intersecting open joints. Maybe in 106 say: "If all the fractures are open, a network with prevalence of I

nodes…" This may not be central to the point that you are making in this paper, but it's such a common and misleading logical jump in fracture network studies (and with respect to length) that the clarification is useful. See the discussion in Forstner and Laubach, 2022, J. Struct. Geol.

Also, if the rock itself is porous, even a network that has only I nodes can markedly augment fluid flow because of flow between fractures through the host rock (Philip et al., 2005, SPE Res. Eval. Eng.); here length distribution is the key parameter (not connectivity) as Philip et al. show, which just makes your focus on length even more important.

122 It seems like these values might also be meaningless for 'stochastic modeling'? Do you clarify this in the Discussion?

129-132 On first read, I found the transitions here confusing. For clarity I think you ought to warn the reader here that you are going to demonstrate the time-length dimensional shift in 3.3. Something like 'Survival analysis is usually used in the time domain. In section 3.3. we show how a time-length dimensional shift is valid. Here we briefly introduce the terms as they are used in the time domain.' These are key lines defining terms. I think they could use some clarification. What do you mean by 'the event of interest is commonly defined as *death*'? Is a clarifying word missing? The 'event of "x" is'? Or do you need some more information at the start of the paragraph: "Survival analysis is used to analyze data in which the time until the event is of interest (for example, the time until death in some medical or biological contexts)." This would perhaps be a good point to introduce the idea that you are substituting distance for time?

133 Which 'length' do you mean here?

173 1D or 2D? How does this conversion work?

190 'simplest'

204 'it has its limitations'

223 '…that can enable the researcher to obtain an informed…'

235 'both figures'

In the example case studies, with such big clear outcrops, can you analyze a small area within the larger area and verify that you are accounting for the censoring correctly?

Recent reference of possible interest: Forstner, S.R., Corrêa, R., Wang, Q., Laubach, S.E., 2024. Fracture length data for geothermal applications. In Gill, C.E., Goffey, G., Underhill, J.R., eds., Powering the Energy Transition through Subsurface Collaboration, Geological

Society of London, Energy Geoscience Conference Series, v. 1, https://doi.org/10.1144/egc1-2024-17

350 Given the limitations of any spacing statistic, I think it would be worthwhile mentioning here that good field practice with scanlines should be to keep track of the sequence of fracture occurrences, in other words, the spatial arrangement, as you've pointed out in other work (and also Marrett et al. 2018, J Struct Geol). Your analysis here seems like it would be equally apt for spatial arrangement data collection and analysis.

376 I agree with this way of proceeding re: defining length. Does your method work as well with lengths defined via branches; is there a reason to choose one or the other? Maybe this gets out of scope, but the way you mention it here might make a reader wonder.

388 This is a big claim that length is always underestimated. What if you have a process that produces only short fractures (or even fractures that are shorter than your outcrop size). Hooker et al. 2013, J. Struct. Geol. describes one set (of several) that only contains very short lengths. Maybe some caveats are in order here.

395 'it'? Maybe 'they are'?

405 Although testing this hypothesis is something that people studying fracture lengths in the context of geomorphology ought to consider. Particularly large or open fractures can affect the size, shape, and occurrence of outcrop. See Eppes et al. 2024, Earth Surface Dynamics, doi.org/10.5194/esurf-12-35-2024.

409 'in key of time' is an odd phrase. Check.

411 'useless' seems harsh. I'm not convinced this extra remark is needed. Anyway, there may be other parameters (like segmentation) that have similar effects to outcrop size that would benefit from the approach you propose, even if outcrops were arbitrarily large.

445 This assumes that measurements are only caried out at one scale of resolution. But this need not be the case. See Ortega et al. 2006, AAPG Bulletin (for aperture sizes) and Forstner et al. for lengths.

451 And for some fracture systems, the smaller fractures are more prone to be mineral filled and potentially less obvious features on images. This size/visibility effect can also manifest in the picking of long fractures if the long traces are segmented.