

The Cryosphere Discuss., referee comment RC1
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Comment on tc-2022-79

Mikhail Kanevskiy (Referee)

Referee comment on "Brief communication: Unravelling the composition and microstructure of a permafrost core using X-ray computed tomography" by Jan Nitzbon et al., The Cryosphere Discuss., <https://doi.org/10.5194/tc-2022-79-RC1>, 2022

Computed tomography of frozen sediments is a relatively new method of permafrost studies. This non-destructive method allows to obtain high-resolution 3D images of frozen soils and estimate volumes of solids, gas, and ice inclusions in permafrost samples. We believe that in the future CT will become a main method of field permafrost studies of frozen soils, and this study makes a significant contribution that may help to improve this method. This manuscript provides unique information on application of CT imaging and image processing methods to quantify properties of the upper permafrost in Yedoma region of northern Yakutia. The authors present a systematic quantitative comparison between the laboratory-measured and the CT-derived composition of permafrost cores, which is extremely important for future development of the CT method. I strongly support publication of this manuscript and recommend to accept it with minor revision. My comments and suggestions are attached.

Please also note the supplement to this comment:

<https://tc.copernicus.org/preprints/tc-2022-79/tc-2022-79-RC1-supplement.pdf>