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Comment on gchron-2022-26

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Community comment on "Multiple Early Holocene eruptions of Katla produced tephra layers with similar composition to the Vedde Ash" by David Harning et al., Geochronology Discuss., https://doi.org/10.5194/gchron-2022-26-CC2, 2022

Tephra studies are becoming increasingly complex as we are refining methodology and analysis and thereby detecting hitherto unknown deposits, reinterpreting old ones, and having more and more trouble separating some of them (chemically and chronologically). It is good to see a study with the intention to highlight a possible problem with a well-used isochron such as the Vedde Ash, but there are some major issues with this manuscript that would probably have to be remedied for the conclusions to be accepted.

- As already commented, the study is missing a complete tephrostratigraphic description and has only sampled visible tephra layers (I'm assuming - this is not explicitly stated. While these can be argued to be "stratigraphically separated", there is a high likelihood of redeposition in such an environment as that of the study site and a complete tephra count for the sequence is, in my opinion, required to motivate the layers as being separate and primary deposits.
- The study is missing a complete description of the creation of the age models. It is specified that it is Bayesian and that IntCal20 was applied to create the age model for the older study's sediment sequence, but no other specifics and no reference for software used is included. The creation of the age model for the present study's sediment sequence is not described explicitly (should it be assumed that the same procedure is applied as for the older?).
- As already commented, the study re-uses quite old radiocarbon dates with wide error margins, recalibrating them to create an age model for the old sediment sequence. This is interesting for comparison purposes but should be interpreted with a great deal of care. The suggested ages for the three tephra layers are based on linear interpolation between two other tephra dates spaced >60 cm apart, which is in my opinion not too robust of an age model. The study would greatly benefit from, if not require, a more complete chronology.
- There is little-to-no lithostratigraphic description of the sample cores. This should be provided and expanded upon when comparing the sediment sequences of the older study and the current one, and hopefully this could provide better motivation for the assumptions being made about the tephra findings in the current study correlating to those in the older study.