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Comment on gchron-2021-12

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Community comment on "A 62 kyr geomagnetic palaeointensity record from the Taymyr Peninsula, Russian Arctic" by Stephanie Scheidt et al., *Geochronology Discuss.*, <https://doi.org/10.5194/gchron-2021-12-CC1>, 2021

The authors' paragraph between lines 315 and 335 refers to a series of studies that estimated the palaeomagnetic lock-in-depth for two Swedish annually laminated (varved) lake sediment sequences and the authors state that "...yet, reported lock-in depths vary widely for both of the Swedish lakes". The authors point out (in lines 329-330) that "the used geomagnetic field reference curves influence the final results". Given the important influence of the applied reference field on the estimated lock-in-depths some additional clarification is perhaps needed. The authors could clarify that Snowball et al. (2013) used the FENNOSTACK reference curve (Snowball et al. 2007). This reference curve was based on the stacking of PSV data obtained from a series of varved lake sediments in Fennoscandia and it does not include any correction for lock-in-depths in the underlying data sets. Thus, Snowball et al. (2013) stated that the estimate of lock-in-depth in Gyltigesjön would probably be a minimum estimate. The subsequent study of Gyltigesjön (and Kälksjön) by Mellström et al. (2015) used the predictions of archaeomagnetic field models as reference curves. By definition, these field models are constrained by archaeomagnetic data, which should not contain any significant lock-in-delay. As foreseen by the preceding study, the refined lock-in-depth was found to be significantly deeper. By applying a Bayesian approach, Nilsson et al. (2018) investigated the influence of changing sedimentation rates on lock-in delay in the same two lakes. Their results were consistent with the earlier studies and demonstrated the importance of the chosen reference curve (and lock-in-depth functions). The current wording in the paragraph (lines 315-335) implies that a series of widely ranging variable estimates were produced in an ad hoc fashion, but there was systematic refinement of the estimates in the series of papers that Scheidt et al. refer to.