

Clim. Past Discuss., community comment CC1  
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## Comment on cp-2021-37

Robert Hellmann

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Community comment on "Improving temperature reconstructions from ice-core water-isotope records" by Bradley R. Markle and Eric J. Steig, *Clim. Past Discuss.*, <https://doi.org/10.5194/cp-2021-37-CC1>, 2021

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For the diffusive contribution to fractionation in the Simple Water Isotope Model (SWIM), a temperature dependence was assumed for the quantity  $\varphi_{\text{diff}}$  [Eq. (A5)] based on one of the sets of mutually inconsistent experimental data. Recent work (Hellmann, R. and Harvey, A. H.: First Principles Diffusivity Ratios for Kinetic Isotope Fractionation of Water in Air, *Geophys. Res. Lett.*, 47, e2020GL089999, <https://doi.org/10.1029/2020GL089999>, 2020) has used molecular theory to determine a more physically correct temperature dependence. The new function differs significantly from what is assumed in this work, although it may not make a significant difference for the main results.