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Comment on egusphere-2022-574

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Community comment on "Predicting trends in atmospheric CO_2 across the Mid-Pleistocene Transition using existing climate archives" by Jordan R. W. Martin et al., EGUsphere, https://doi.org/10.5194/egusphere-2022-574-CC1, 2022

This is a potentially interesting study, which might gain from some more discussions of what has already been done with respect to CO2 across the MPT. Some comments, which might be of interest to the authors:

1. To be transparant in what has been done, the equation which calculates CO2 out of the LR04 benthic d18O stack is missing. Plotting of the LR04 benthic d18O, which is at the core of the approach is also missing.
2. Blue ice CO2 data from Allan Hills have been extended in Yan et al (2019), now also containing snapshots of CO2 at 1.5 and 2.0 Ma.
3. A recent paper by Yamamoto et al (2022) calculates CO2 over the MPT from leaf wax d13C and finds that smaller glacial/interglacial amplitudes in CO2 before the MPT are based on stable glacial CO2, but smaller interglacial CO2 before the MPT. This differs to the d11B-based CO2, and if I got it right might support the here defined Null Hypothesis, which then cannot easily be dissmissed.
4. New CO2 data based on d11B from Pacific cores have recently been published (Guillermic et al., 2022). Ok, data coverage across the last 1.5Ma might be weak, but worth discussing it.
5. CO2 as function of benthic d18O has in an inverse modelling approach already been calculated by Stap et al (2016). This approach has been updateded by Berends et al. (2021a). So comparison to their results might tell, how (if at all) this study shows something new.
6. Maybe also discuss other approaches of CO2 across the MPT, eg C cycle simulation results (apart from those in Willeit et al, 2020, which are cited) of Köhler & Bintanja (2006), or the compilation of at that time available CO2 data and the calculation of a continous high-resolution CO2 record in van de Wal et al. (2011), updated in Stap et al. (2018).
7. The recent review on the MPT (Berends et al., 2021b) gives also an idea about processes including a collection of CO2 data and discusses a potential influence of the carbon cycle on the climate transition.
8. While mentioning the call for the EPICA challenge, maybe also cite / discuss its results (Wolff et al., 2005). They have been shown on 2 posters at AGU fall meeting in 2004 (PDFs for download at: https://epic.awi.de/id/eprint/11721/, https://epic.awi.de/id/eprint/11722/), on which you see, that one of the participants to the challange (N Shackleton) also used d18O to predict CO2 for the 400-800 ky time window.

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