Climate of the Past Discussions

Clim. Past Discuss., community comment CC1
https://doi.org/10.5194/cp-2022-52-CC1, 2022

Comment on cp-2022-52

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Community comment on "Causes of the weak emergent constraint on climate sensitivity at the Last Glacial Maximum" by Martin Renoult et al., Clim. Past Discuss., https://doi.org/10.5194/cp-2022-52-CC1, 2022

This is a very rigorous and clear paper. The conclusions make a great deal of sense to me, given all the non-CO_2 forcings during the LGM, many of which play into the most uncertain and poorly constrained aspects of climate models, LGM never made much sense to me as a good setting for a strong emergent ECS constraint.

As a minor point, while I think the discussion of the Pliocene is relevant, some brief discussion of the Eocene, Oligocene, and Miocene might also be relevant. Not as a general, anodyne statement, but as a specific recommendations. If the LGM is a weak candidate for constraining ECS, are there realistic combinations of paleogeographic boundary conditions and climate data/patterns that *would* make an excellent candidate? If so, could you speculate a bit about which ones might be better than LGM? The warming signal for example in the Miocene is at least twice as big as in the Pliocene, but with only moderately higher CO_2 (https://cp.copernicus.org/articles/10/523/2014/ https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2020PA004037) and paleoclimate model ensembles exist (https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2020PA004054). Would that have a higher signal to (non-CO_2)-noise ratio? What are the properties of the ideal ECS emergent constraint paleo configuration?

Really good paper!

-Matthew Huber