Climate of the Past Discussions

Clim. Past Discuss., referee comment RC4
https://doi.org/10.5194/cp-2022-2-RC4, 2022

Comment on cp-2022-2

Anonymous Referee #4

Referee comment on "Stratigraphic templates for ice core records of the past 1.5 Myr" by Eric W. Wolff et al., Clim. Past Discuss., https://doi.org/10.5194/cp-2022-2-RC4, 2022

In anticipation to the new ice core data beyond the Myr that the community will generate, Wolff et al. propose an overview of the possibilities that the community could have to correlate and date such old records. As per request from the handling editor, because the other reviewers have already commented on other points of the MS, and because this is indeed my expertise, I have concentrated my review only on the dust part of the paper.

I have two major issues :

- The authors compare the dust flux in ice on one hand, and an iron concentration on the other, justifying it by the fact that claim dust flux is what they will get in older ice cores, and claiming it is fair to compare it to concentration. I am sorry, but to me it is a bit like comparing apples and pears. And it has been a redundant problem within the dust community working on different archives. As the authors mention, to calculate a flux, one needs ages and accumulation rates, but those accumulation rates would also influence a concentration profile when using it. It is commonly accepted that fluxes or at worse ratios should be priviledged when comparing dust proxies between archives, so it is accept that fact and how to solve this issue if this is problematic for some archives or time intervals. Otherwise, again, it makes any comparison quite speculative despite a match which is indeed surprisingly good.

- What is "appropriate scaling". This is somehow linked to my previous comment as it feels like two curves which are in theory not comparable, can be perfectly "matched". There is no details whatsoever how this scaling is achieved. This is also valid for other matching in the MS, and also more generaly in the literature matching ice and marine records. There is absolutely no details on how it is achieved, and it would be good to provide a detailled explanation on this, including the calculations, how it is done ("stretching-compressing" method?, but how, on which time interval, varying depending on the time interval, etc?), all that in supplementary data, so everybody could understand and more importandly, reproduce it.

Minor comments/questions:

- I am ot a specialist in this, but really no means to date both marine and ice cores beyond 1Myr? That would help generating fluxes... And perhaps this is something the community should concentrate on?

- I think the reference citing dust from Patagonia to Antarctic could be reviewed by adding more recent references than only Delmonte, 2008.