

Dear Editor,

please find below our replies to your specific comments.

-On line 232, I propose to clarify what the "data request" is with something like "The CMIP6 data request, which contains the list of all variables requested for each MIP, is at: ..."

REPLY: we have modified the text accordingly

-On line 279, you propose a "reference simulation (control-slab) ... using the mixed layer depth climatology". I suppose you mean that the thickness of the slab ocean will vary for each grid point following the mixed layer depth climatology? If this is so, maybe you could be a bit more precise and specify that the mixed layer depth climatology will contain one value for each month for each grid point, or something equivalent for clarity?

REPLY: we have modified the sentence as follows: "A reference simulation (*control-slab*) shall be set up using the spatially non-uniform annual-average mixed layer depth climatology of the coupled model. *control-slab* should include a minimum of 20-year spin-up followed by a 10-year control integration."

-On p.8 and 9, why did you keep "DynVar" (i.e. why didn't you change "DynVar" for "DynVarMIP") in "DynVar diagnostics"?

REPLY: We have replaced "DynVar" with "DynVarMIP" throughout the text.

-On line 630, I know of course that datasets can be available through ESGF with version control and DOIs assigned. But is that really also true for tools?

REPLY: We have modified the sentence as follows: "The forcing datasets for the *volc-pinatubo* experiments will be made available through the ESGF with version control and DOIs assigned. EVA version 1.0 code, a user's manual, sample input data files and driver scripts, are included as supplementary material by Toohey et al. (2016a)."

Accordingly, we now also specify EVA "version 1.0" in line 430.

-On Fig. 4a, "Tambora" and "High Latitudes" appear on the figure but the legend does not use these words. Could you add in the legend "Tambora" before "black line" and "High Latitudes" before "blue line", or change "Tambora" for something like "equatorial" and "High Latitudes" for "extra-tropical" on the figure?

REPLY: we have modified the figure, including the legend (now reporting the name of the experiments) and the title of panel b (now reporting the name of the experiment). For consistency, we have also changed the title of panel b in Figure 3, to report the name of the associated experiment.

We have also amended the reference section.

Sincerely,

Davide Zanchettin

on behalf of all co-authors