

Review comments for GMD-2022-167

“The pseudo-global-warming (PGW) approach: Methodology, software package PGW4ERA5 v1.1, validation and sensitivity analyses” submitted to GMD.

Summary:

The questions and comments I pointed out in the first review have been appropriately addressed. The manuscript has been adequately improved. I think this paper is suitable for publication in GMD. I will give several suggestions below as minor/technical comments.

Minor/technical comments:

[1] L. 113

If the method you mentioned here is the same as one of Misra and Kanamitsu (2004), you should be better to add it to the reference;

Misra, V., and Kanamitsu, M. (2004). Anomaly nesting: A methodology to downscale seasonal climate simulations from AGCMs. Journal of Climate, 17, 3249–3262.

[2] L. 114-116

“one has to use some reanalysis ERA, ...” might be better like “one has to use some reanalysis such as ERA, ...”.

ERA and *HIST* in “ $\Delta = \text{ERA} - \text{HIST}$ ” are long-term mean, whereas *CTRL* and *HIST* in “ $\text{CTRL} = \text{HIST} + \Delta$ ” are typically 1 to 6 hourly data. Thus, *HISTs* are used in different senses. It would be better to state that *ERA* and *HIST* in “ $\Delta = \text{ERA} - \text{HIST}$ ” are long-term mean or climate mean. Otherwise, the readers might misunderstand it like $\text{CTRL} = \text{HIST} + \Delta = \text{HIST} + (\text{ERA} - \text{HIST}) = \text{ERA}$.

[3] Figure 2

This is just a recommendation; it will be better to add Δ_{GCM} at “climate change” in blue in Figure 2, which will support the reader's understanding.

Caption of Figure2:

“The subscripts denote the underlying computational mesh” --- The computational mesh of LBC and RCM is generally the completely same, isn't it?

[4] L. 235-236

This is also just a suggestion; it would be more clear if you write “..., we add the Δ_{GCM} to the ERA reanalysis (see Fig. 2). To this end, ... from GCM to the ERA grid, i.e., Δ_{ERA} ,” because Δ is used as both meanings of Δ_{GCM} and Δ_{ERA} , which is a bit complicated.

[5]

I suggest swapping Sec. 2.7 and Sec. 2.8, since the explanation in Sec. 2.8 is a continuation of that in Sec. 2.6.

[6] L.290

“Computation of q_v from temperature and relative humidity” --- Does it mean ‘temperature and relative humidity, i.e., χ' in Eq. (8)’?

[7] Caption in Figure 8

“Change” after “in (a-c)...” may not be necessary; that is, “...for annual-mean changes in (a-c) mean precipitation, (d-f) precipitation frequency ...”.