

Reviewer #2

We thank the reviewer for their constructive and insightful comments and hope that we have addressed them adequately. Below are our responses (in blue).

The proposed pacemaker runs are designed to explore TBI via the atmospheric Walker circulation with SST restoration applied to narrow equatorial oceans (Fig. 3). Here are some slight changes in the domain(s) of SST restoration that could allow other modes of TBI.

1. Western North Pacific. Recent studies identified a coupled Indo-western Pacific ocean-atmosphere mode in post-ENSO summer (JJA). Its SST signature is also known as, but more complex than, the IOB mode, while the atmospheric component features a large-scale anomalous anticyclone (AAC) that covers the entire Indo-western Pacific north of the equator. A tropical Pacific domain with a wedge that reaches all the way to the maritime continent on the equator but avoids much of the off-equatorial western Pacific would be able to capture AAC and Asian summer monsoon variability/predictability (P. Zhang et al. 2024, *J Climate*). Climatically, the South China Sea is in the monsoon westerly regime that includes the North Indian Ocean (e.g., Fig. 2 of Zhang et al. 2024). Thus, the South China Sea should be part of the Indian Ocean, rather than the Pacific, for SST restoring.
2. In the Atlantic, the proposed SST restoration is limited to a narrow 10S-10N band. This could miss the subtropical atmospheric Rossby wave pathway connecting the broad tropical North Atlantic with the subtropical Northeast Pacific and then ENSO through WES (Ham et al. 2013a,b, cited in the paper) and low cloud (A. Miyamoto 2025, *J Clim*) feedback mechanisms.

The TBI team might want to consider these slightly modified configurations as possible extensions of the current TBIMIP.

Thank you for the thoughtful comments. These are valid concerns and, should computing resources allow it, we will try to address them with additional experiments. For the TBIMIP, we use the basin masks provided by the World Ocean Atlas (Locarnini et al. 2010), but an experiment using a wedge mask that excludes the South China Sea and western Pacific is under discussion (see Appendix A TBI-pace-Pwedge).

Regarding the northern tropical Atlantic influence, Fig. 1 in Ham et al. (2013a) suggests that the convective response to the northern tropical Atlantic SST anomalies mostly occurs in the equatorial region. There are, however some precipitation anomalies north of 10N in the Caribbean during summer, so it cannot be ruled out that SST anomalies north of 10N can also have remote impacts. This should be further investigated.

Minor comments

There are two Chang et al. (2006) references, which may need to be labeled as a, b.
Done.

Xie and Carton (2004) not in References.

We added this reference.

L289. “subtropical” --> “subpolar”?

“Subtropical” is correct but we realized that one of the references (Kim et al. 2024) is not relevant here and have removed it. In addition, another reference (Kim et al. 2020) only indirectly concludes that the role of the subtropical North Atlantic may have been overestimated. We have reworded this sentence accordingly.