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Dear Dr. Messori,

we have gratefully taken the opportunity to discuss the mentioned literature and prepare supplementary information containing the details and figures of our robustness tests.

Regarding the literature, we want to thank you for pointing us to the papers. We have carefully checked them and have included Woelfe et al. 2015 and Adam et al., 2018 in our conclusion section. The paper of Kang and Xie (2014) only considers the time mean SST and ITCZ and so we did not include it. We do believe the reviewer instead meant Kang et al., 2014, *Clim Dyn*, 42:20332043, doi:10.1007/s00382-013-1863-0. Although this paper very briefly touches upon the transient response to extratropical heating changes, the time lead of extratropical SST is not as clear as in Woelfe et al. We therefore did not include Kang et al. 2014.

To complement our analysis, we have now included the figures illustrating the results of the robustness tests. In that scope, we have also identified a minor error in the complete linkage scheme analysis, which actually led to an increased similarity between the employed single linkage approach. Therefore, we have conducted slight changes in that direction in the main manuscript as well (page 11, lines 263-272).

On behalf of the authors,

Sincerely,

Frederik Wolf