Response to reviewers

My previous comments and suggestions are well addressed in the revision. Nevertheless, I still have some minor comments regarding the new content, as listed below. Most of them are for clarification.
(The line numbers referenced below correspond to those in the 'track-changes' file.)
We thank the reviewer for their time reading this manuscript, and have made the minor changes suggested. Line numbers refer to line numbers in the tracked changes file.

- Structure of methodology:
Consider moving Sections 2.2/2.3 to 2.1/2.2, and moving Section 2.1 to 2.3, so that the descriptions of the data and methodology can be better organized together.
We agree with the logic of this and have made this adjustment.

- Lines 278-279
I like the comparison and interpretation here. However, there is a very minor point to note: the cross-equatorial moisture flux equals the inter-hemispheric asymmetry of E-P, while the cross-equatorial AHT_LH equals the inter-hemispheric asymmetry of E. Strictly speaking, a correlation with AHT_LH does not automatically guarantee a correlation with the cross-equatorial moisture flux.
Thank you for noting this could be made more precise, this line has been edited (lines 292-295) to:
"One interpretation of Figs. \ref{AHT_correlations}a, c and d could be that the precipitation centroid relates more closely to the overturning mass streamfunction and so AHT$_{eq}$, while the maximum precipitation latitude may relate more closely to cross-equatorial moisture fluxes characterized by the gradients in P-E, which may be partially captured by the latent heat attributed component of AHT$_{eq}$."

- Lines 326-328
I would expect a La Niña-like response if the easterlies occurred in the low latitudes; however, according to Fig. 4, the wind anomalies emerge in the subtropics. Therefore, I am not sure if I would expect a La Niña-like response in this case.
Also, I see no benefit in mentioning this, as it is opposite to your results.
We appreciate this point and have removed the sentence discussing La Niña (lines 329-331).

- Line 423:
It should be "JJA PC1".
Additionally, the sentence involving multiple combinations of JJA/DJF and PC1/PC2 is quite dense and difficult to follow. I recommend rephrasing it into separate sentences to improve clarity. For example:
"We find a weak correlation between PC1 in JJA and DJF (Pearson's r = 0.27, p = 0.1). Similarly, PC2 between the two seasons shows a weak correlation, with a Pearson's r of 0.31 (p = 0.05). No significant correlations are found between PC1 and PC2 across different seasons."
Thank you for this suggestion, the text has been modified accordingly (lines 423-427).

- Lines 405-409
Are the correlations calculated using the PCs themselves (SSP5-8.5 χ) or the shifts of the PCs (SSP5-8.5 χ minus historical χ)? I suppose it is the latter, but the current description is not clear enough to me.
Thank you for noting that this was unclear, we have adjusted the wording on lines 435-436 to: “Again, we also test correlations between the (\textit{SSP5-8.5} - \textit{historical}) change in PC1 and 2 for JJA and DJF.”

Also, the negative correlation of PC2 between the two seasons suggests that models with a more northward AHT in JJA also tend to have a more northward AHT in DJF. Does this reflect the uncertainty in the annual-mean AHT among models?
We have added a brief comment on this point on lines 439-440: “This may reflect known intermodel differences in the changes in annual-mean interhemispheric thermal contrast \citep{Chen2022}.”