**Supplementary Material for Changes in the tropical upper tropospheric zonal momentum balance due to global warming**

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**Figure S1.** Climatological Day of Year variation of \(v_d\) (blue) and \(-5 \cdot \partial_y u_r\) (red) zonally averaged over all longitudes (solid), A-Af (dashed), CP-WA (dash-dotted) and Africa (dotted). As Figures 1 and 3, all quantities are averaged over 150-300 hPa, about \(\pm 5^\circ\). \(-\partial_y u_r\) has been multiplied by 5 to ensure a vertical scale similar to \(v_d\). A 20-day low-pass filter has been applied prior to presentation.
Figure S2. Seasonally and zonally averaged vertical structure of (a-c & g-i) eddy momentum flux convergence and (d-f & j-l) mean meridional momentum flux convergence for reanalysis, averaged over (top half) summer and (bottom half) winter. The quantities displayed are computed over (left column) the global longitudes, (middle) Af-A and (right) CP-WA, respectively. In each panel, the black curve is indicative of the multi-model mean tropopause height over the corresponding region (see Reichler et al., 2003).

Figure S3. Zonally symmetric SST forcing (K) with peak at 10°N superimposed with a planetary scale wavenumber-1 SST perturbation located at 30°N (Wu and Shaw, 2016). Peak magnitude of the SST perturbation is 7.5K.
**Figure S4.** Latitude-height section of zonal mean potential temperature for (left) historical and (right) ssp585.

**Figure S5.** Temporally and zonally averaged zonal wind spread for the CMIP6 fully coupled simulations for averaged over $\pm 5^\circ$ of the equator and 150-300 mbar. The data represented are annual, winter, and summer season means for the control and forced multi-model ensembles. Points marked with black stars indicate the mean, while the horizontal red lines indicate the median. The lower value indicated by the box plot is the first quartile ($Q_1$), while the upper value is the third quartile ($Q_3$). For each box plot, the reach of the whiskers is $1.5 \times IQR$ beyond $Q_1$ and $Q_3$, where $IQR = Q_3 - Q_1$. The red dots are outliers.
References
