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*Supplement of*

## **Climatological impact of the Brewer–Dobson circulation on the N<sub>2</sub>O budget in WACCM, a chemical reanalysis and a CTM driven by four dynamical reanalyses**

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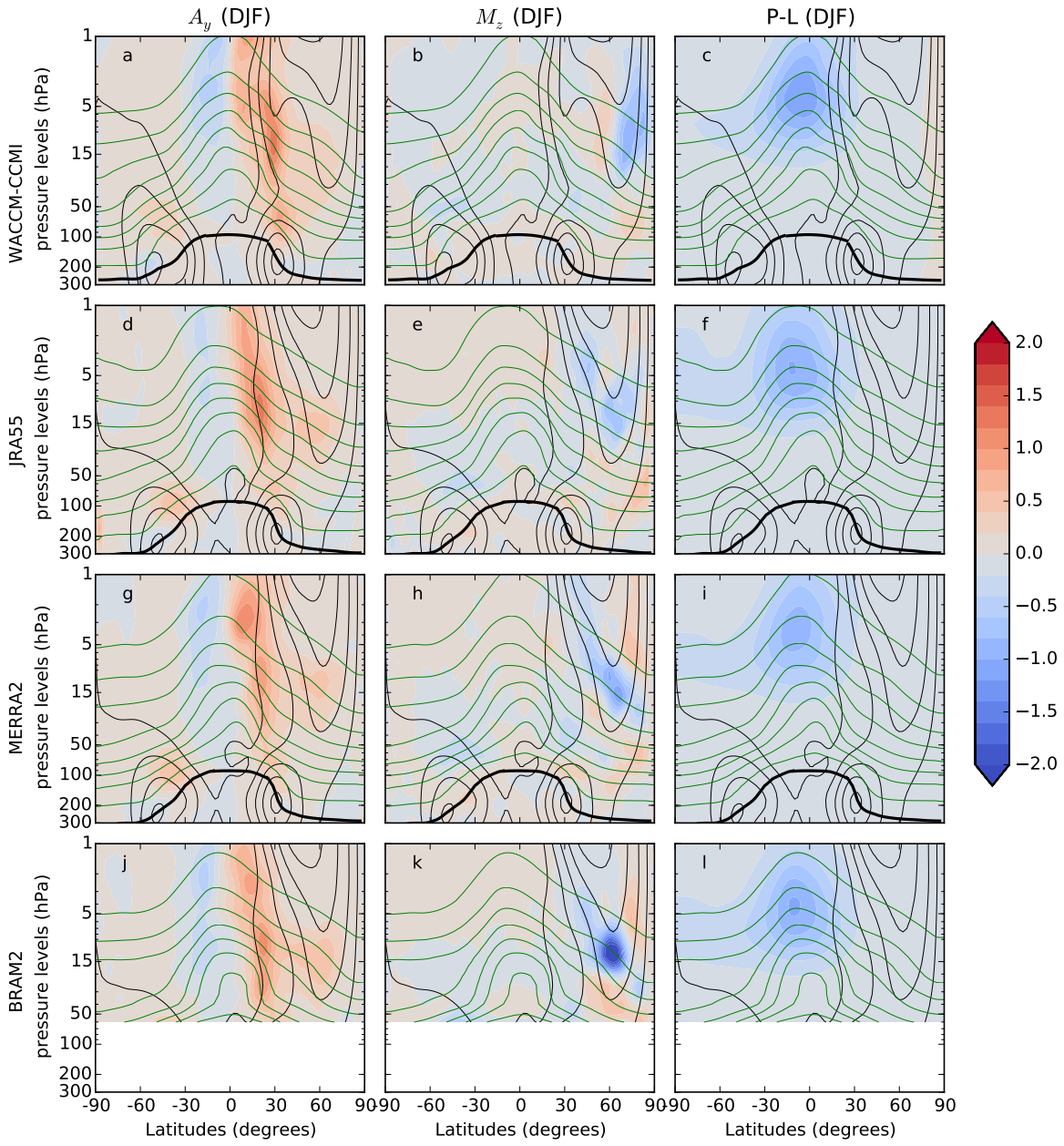


Figure S1: As Fig. 3, but for  $A_y$  (left column),  $M_z$  (middle column), and  $P - L$  (right column).

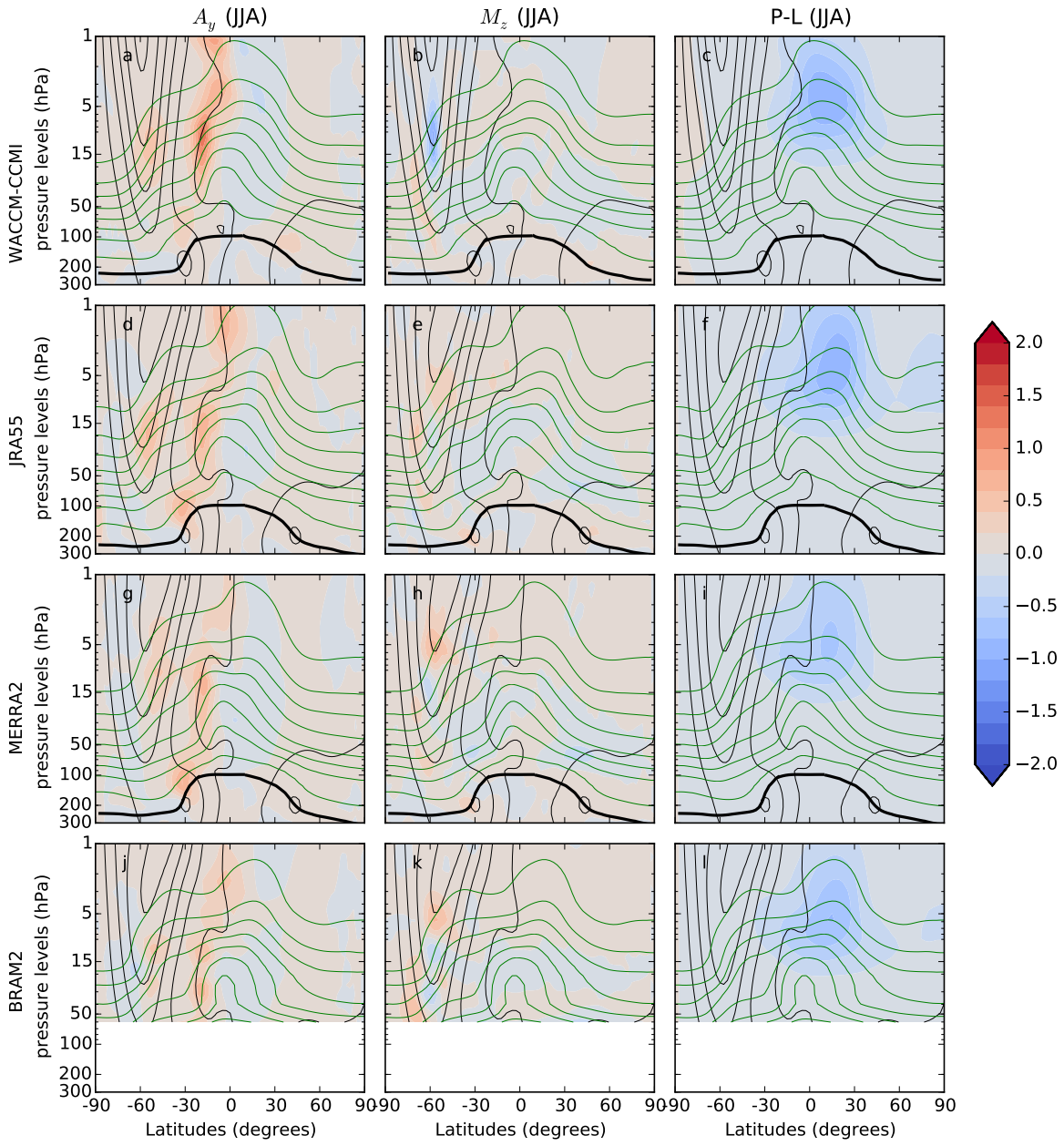


Figure S2: As Fig. 4, but for  $A_y$  (left column),  $M_z$  (middle column), and  $P - L$  (right column).

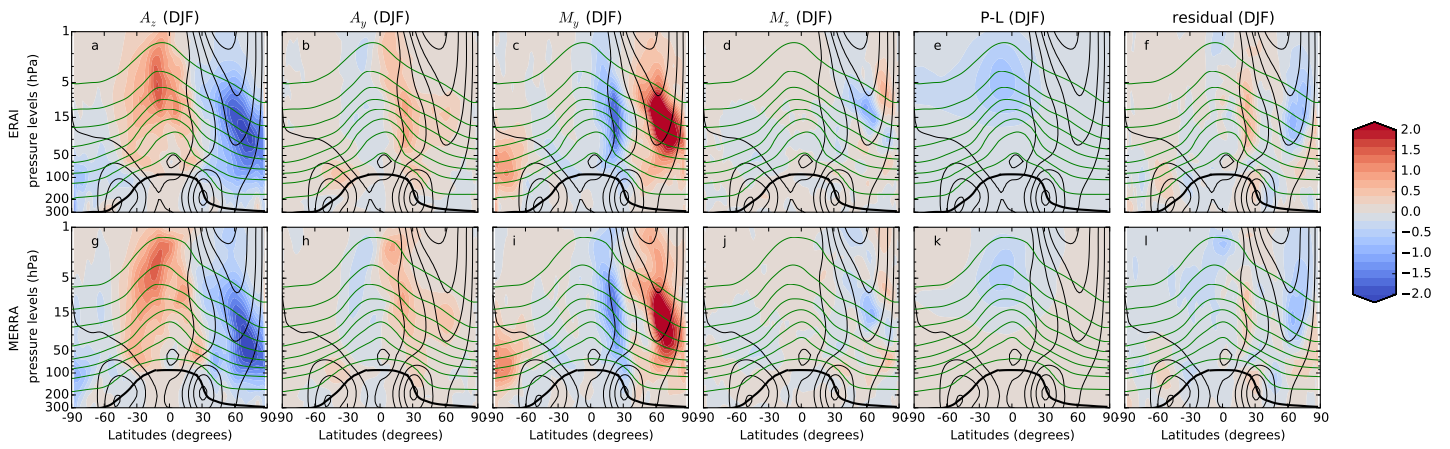


Figure S3: Climatological (2005-2014) latitude-pressure cross sections of the total TEM budget terms averaged in DJF for ERAI (top row) and MERRA (bottom row). From left to right:  $A_z$ ,  $A_y$ ,  $M_y$ ,  $M_z$ ,  $P - L$ , residual.

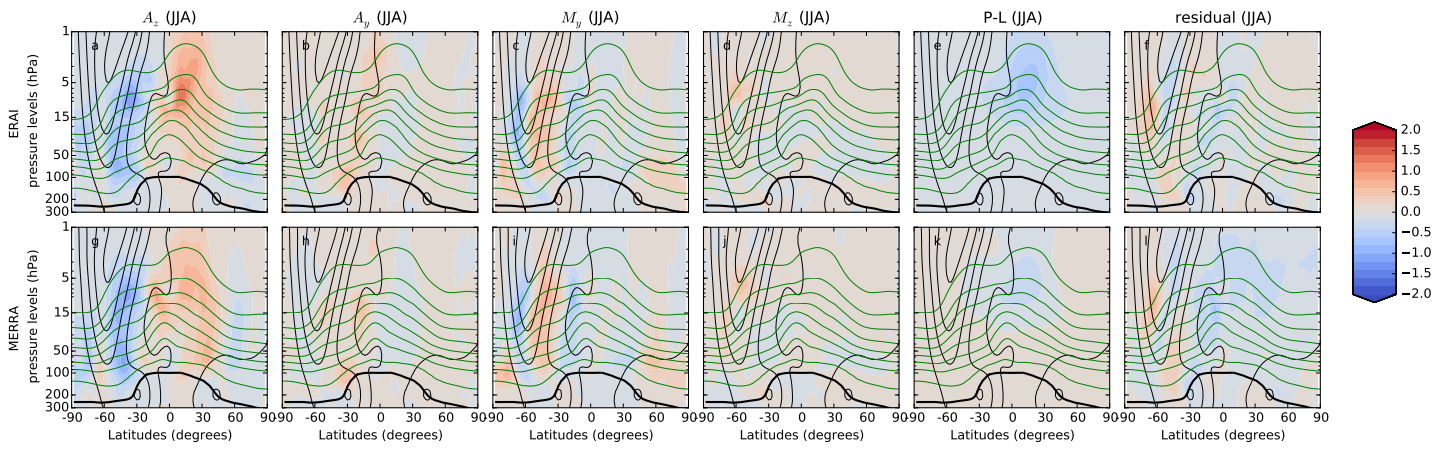


Figure S4: As previous figure but for the JJA season.

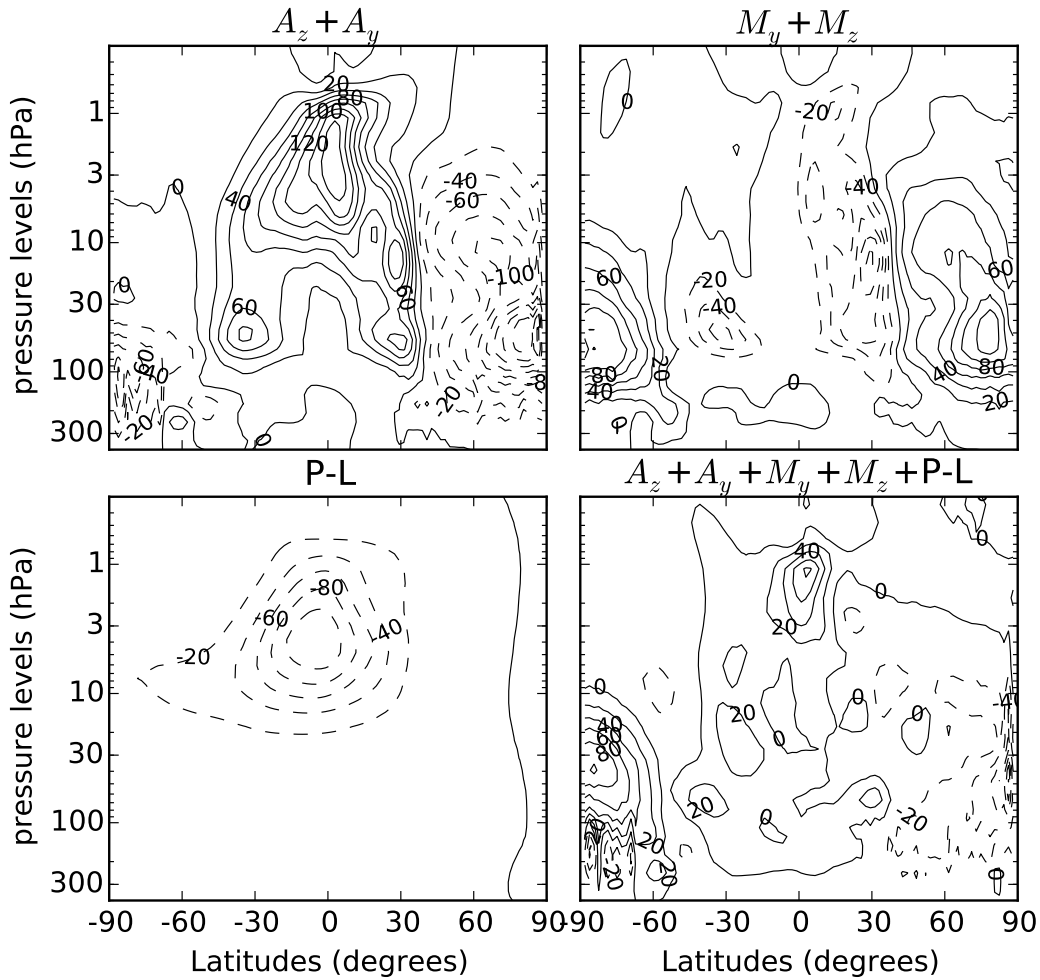


Figure S5: As Fig. 8 in Randel et al., 1994 but for the WACCM-CCMI ensemble mean in DJF (2005-2014). Upper left: total advection term; upper right: total mixing term; Lower left: chemical source; Lower right: sum of the previous terms.

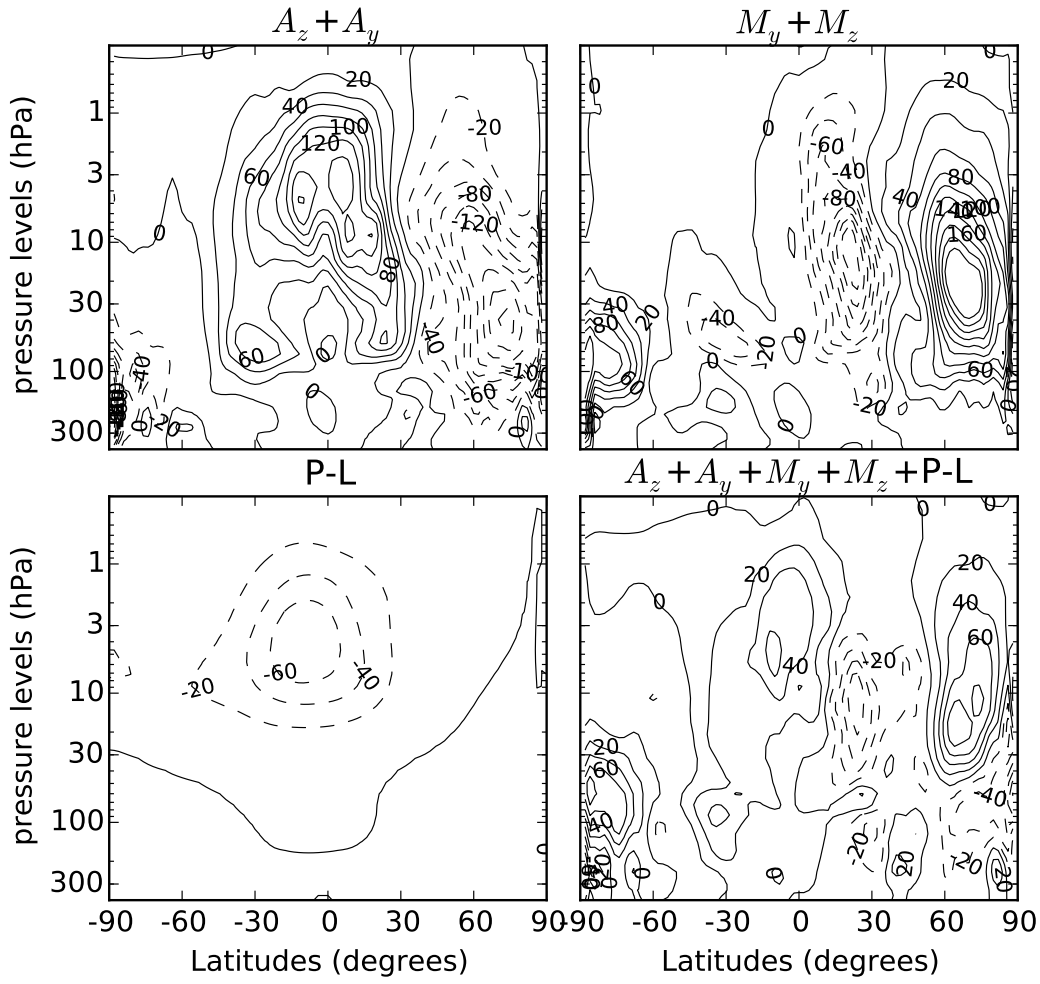


Figure S6: As Fig. for previous figure but for the reanalysis ensemble mean.

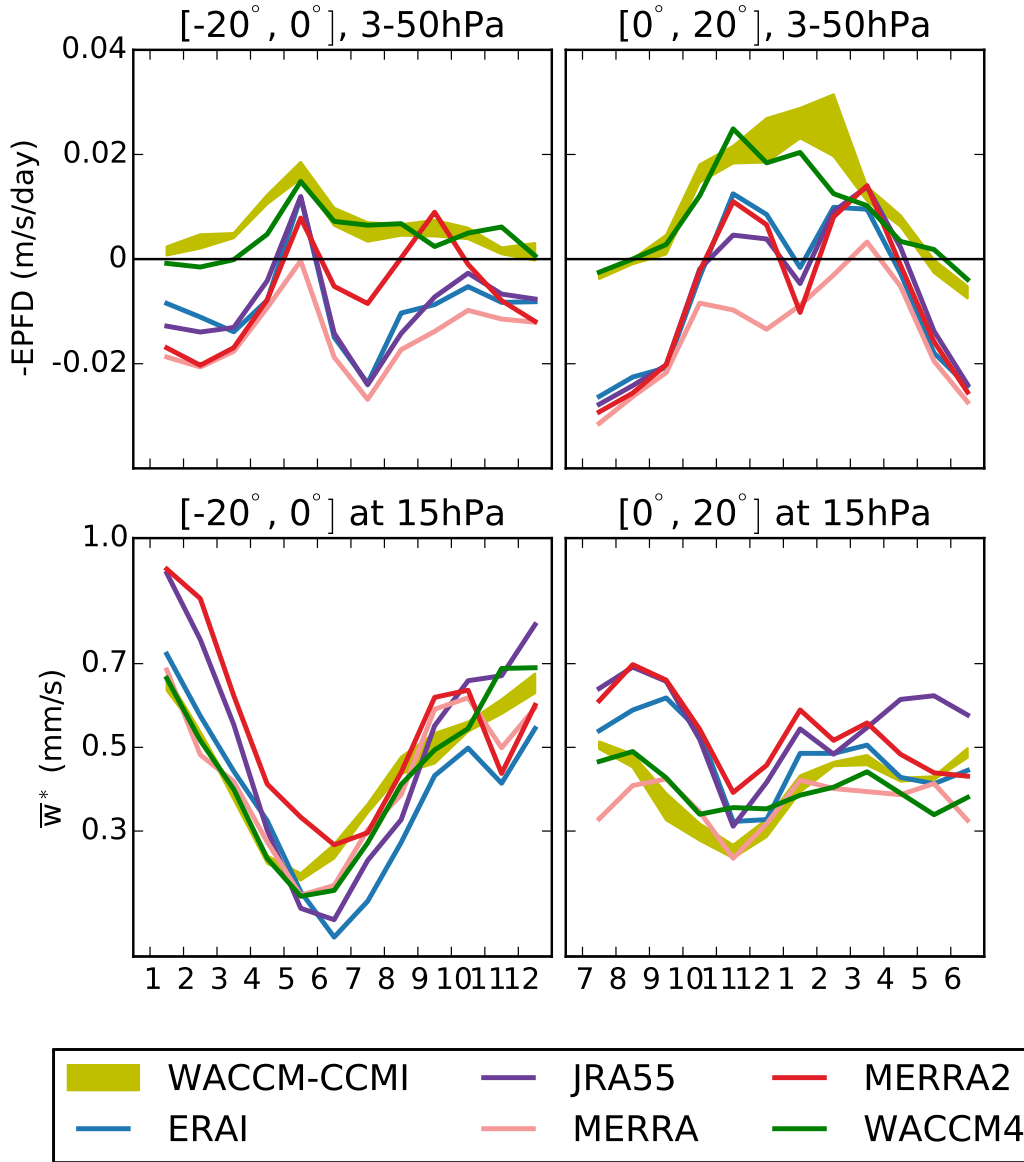


Figure S7: As Fig. 5 but for the tropical regions.