



High latitude temperature trends, tropical temperature trends and the Brewer-Dobson circulation, 1979-2008

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We examine monthly trends in brightness temperature data from the lower stratospheric channel of microwave sounding unit (MSU T4/TLS). As a consequence of the Brewer-Dobson circulation (BDC), there is a large degree of coupling between the interannual variability of temperatures at high latitudes and in the tropics. We use this relationship to show that the 1979-2008 warming trend at northern high latitudes in January, and southern high latitudes in September is congruent with a net strengthening of the BDC at these times, in agreement with previous work that used reanalysis data (Lin et al., 2009; Fu et al., 2009). We also examine the potential drivers of a BDC slowdown during northern hemisphere spring, evident by a high latitude cooling trend during March. Furthermore, we suggest that the tropical-high latitude relationship can be used to improve uncertainties in stratospheric trends.

Fu, Q. et al. (2009), *Atmos. Chem. Phys. Discuss.*, 9, 21,819-21,846.

Lin, P. et al. (2009), *J. Clim.*, 22, 6325-6340