



Is Stratosphere-Troposphere Coupling Linear?

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On first glance, the 'dripping paint' figure of Baldwin and Dunkerton suggests that the influence of Arctic stratospheric variability on the tropospheric jets is linear: weak vortex events tend to drive the jets equatorwards while strong vortex events drive them polewards. If one views stratospheric dynamics as a competition between radiative cooling and dynamical heating—processes with a large time-scale separation—this apparent linearity is surprising. On the other hand, if one views the influence of the stratosphere as an 'external forcing' on the tropospheric jets, the linearity might be expected. In addition to being of fundamental dynamical interest, this issue has an important bearing on the interpretation of commonly applied diagnostic tools. The linearity of the coupling will be discussed in detail, and evidence for threshold-type behaviour will be presented.