



## **Tropical tropopause variability and PDO**

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Recent studies show that the tropics are changing and in particular that the tropical belt is progressively increasing since at least the late 1970s. The widening trend has been mostly attributed to direct radiative forcing, in particular those related to greenhouse gases and stratospheric ozone depletion, while both modelling and observational results seem to rule out a direct involvement of the SST (Sea Surface Temperature) on the long term tropopause tendency. However, interannual tropopause variability has been suggested to be related to SST anomalies investing the tropics and, in particular, the West Pacific oceanic region. In this work the effect of the PDO (Pacific Decadal Oscillation) phase on the tropopause are studied in terms of tropopause width, height and temperature, by using both modeling and experimental data.

Results evidence a lowering and a widening of the tropical tropopause during spring and summer boreal seasons linked to the switch of the PDO index from positive to negative values. These effects are suggested to be related to the PDO induced perturbation of the Brewer-Dobson circulation. Possible relationships between the PDO phase variability and the decrease in stratospheric water vapor beginning in approximately 2001 are also discussed.