

# **Role of zonal circulation in the exchange of minor constituents between the upper troposphere and lower stratosphere**

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This article presents the possible role of zonal circulation in the exchange of minor constituents between the upper troposphere and the lower stratosphere through the tropical tropopause. It is well-known that cold temperatures near the tropical tropopause are crucial regulators of the global stratospheric water vapor abundance. In the present study, eleven years (2007-2017) of COSMIC temperature and MLS water vapor profiles are utilized to examine how well the cold point temperature regulates the entry of water vapor to the lower stratosphere in the various tropical regions. Above an altitude of ~15 km, water vapor signature clearly shows the slow ascent of air parcel and dehydration that is linked to the local temperatures near tropopause. A correlation study is carried out between the estimated saturation mixing ratio and water vapor measurements corresponds to the cold point tropopause. The zonal structure of correlation at tropics clearly exhibits the rising and sinking locations of zonal Walker circulation with highest correlation over the rising branches. The detailed results will be presented in the upcoming symposium.