

Recent variability and zonal asymmetry in upper troposphere and lower stratosphere observed with GPS radio occultation m

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Tropical upper troposphere and lower stratosphere (UTLS) variability and zonal asymmetry are explored using global positioning system radio occultation (GPS-RO) measurements. GPS-RO offers global monitoring of fine structures of the UTLS temperature variability. GPS-RO continuous measurements from CHAMP (2001-2006) and COSMIC (2006-2013) for about 13 years allows us to study the interannual variability, trends (over the last decade) and its fine zonal structures. The warming of UTLS temperatures between 100 and 50 hPa, warming of tropopause and decrease in its height have been observed over the last decade. The possible reasons for such changes linking to the recent moderate volcanic eruptions and dynamical changes involving changes in sea surface temperature and Brewer Dobson circulation will be discussed. The variability and structure observed in GPS-RO will be compared with existing conventional radiosonde and reanalysis datasets.

Keywords: UTLS Temperature, Zonal Assymetry, GPS Radio Occultation, Moderate Volcanic Eruptions, Dynamical Changes