

Correlation among water vapor and ozone as observed from Aura/MLS

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We present a relationship between water vapor mixing ratio (WV) and ozone mixing ratio (O3) measured by Aura/MLS in the tropical upper troposphere and lower stratosphere during 2005-10. Seasonal variability is analyzed in WV and O3 using MLS data. During summer (April-September) WV and O3 scatter plots are used to examine the relationship between them at different pressure levels. Around 100 hPa and above, it seems that there is an increasing linear tendency between WV and O3 with a high correlation coefficient. However, during winter (October-March) it seems that there is an association between WV and O3 but comparatively lesser than summer. From the scatter plots of WV and O3, it appears that during convection WV is injected from troposphere to lower stratosphere in the tropical region. However, the increasing amount of O3 and WV just above tropopause appears that it is dynamically controlled during summer. The O3 values are in general high during summer as compared to winter and are larger by a factor of ~ 2 while at 68hPa WV values are high during winter by a factor $\sim 1-2$. The temperature during summer show high values as compared to winter above tropopause. Our analysis suggests that there is a need to study jointly O3 and WV that would help in better understanding the transport in the TTL region and above.

Keywords: Tropical Tropopause Layer, Water Vapor, Ozone