



Dehydration, transport and wave activity in the tropical tropopause layer during the season of warm tropopause temperatures

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The amount of stratospheric water vapor is largely controlled by the dehydration processes in the tropical tropopause layer. A considerable number of campaigns have taken place during the northern winter months, which corresponds to the season of cold tropopause temperatures. Few observations have taken place during the season of warm tropopause temperatures. The Ticosonde-Aura/TCSP-2005 campaign took place in July 2005 and a total of 24 CFH water vapor and ozone sondes were launched at Alajuela, Costa Rica. These sondes provide detailed observations of the water vapor and ozone in the tropical atmosphere from the surface to the middle stratosphere. The observations took place during the season of warm tropopause temperatures and show generally higher amounts of water vapor in the tropopause region compared to mean stratospheric values. The two coldest tropopause events during the period July-August occurred during the intensive observation period and water vapor soundings show the drying to well below mean stratospheric mixing ratios as a result of these events. Radiosondes were launched 4 times daily and provide a high resolution picture of temperature and wind in the upper troposphere and lower stratosphere and show that the cold events are related to wave activity in the UTLS region. There is a strong correlation between the anomalies in temperature, zonal wind and ozone. A correlation to water vapor anomalies is not obvious, possibly limited by the accuracy

of the observations in the lower stratosphere.