

## **Lidar and Radar observations UT/LS Dynamics Over Tropical and Sub-tropical Stations**

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### **Brief Abstract:**

Clouds and aerosols play key role in radiation budget of Earth's atmosphere through their direct (scattering and absorption) and indirect (clouds and haze) interaction with both solar and terrestrial radiations. The region of tropopause is the region where Ozone, water vapor, cirrus clouds and aerosols have strong influence on the atmospheric radiation budget and it is also the region that couples the stratosphere and troposphere. Thus, the tropopause region is of critical importance for understanding the long term changes of Earth's climate and is an integrated indicator of human-induced climate change. The UT/LS region, including the region of tropopause, is associated with large gradients of various atmospheric parameters and play very key role in the dynamics of both troposphere and stratosphere. Optical properties of UT/LS region are also very important because of presence of cirrus clouds and aerosols, affecting the local radiative forcing. Combined radio and optical remote sensing of the UT/LS region offers excellent opportunity to monitor both dynamics and optical characteristics of this region including the tropopause. Monitoring of UT/LS region using lidar and VHF radar, with fine height and time resolutions, is expected to provide better understanding of UT/LS dynamics including Stratosphere Troposphere Interaction. The capabilities of VHF radar includes monitoring of vertical wind and stable layer structures in UT/LS region where as the lidar can be utilized to monitor cirrus clouds and aerosols in this region. Utilization of satellite/lidar measurements of ozone and water vapor further enhances the understanding STE and its impact on the climate. In the present paper, an attempt has been made to study UL/LS dynamics using lidar and VHF radar over, Gadanki, a tropical Indian station. Similar study has been carried out using lidar at Chung-Li, a sub-tropical station in Taiwan. Water vapor measurements from HALOE observations also presented.