

Occurrence of the Cirrus clouds and its effect on the thermal structure of the tropical tropopause layer (TTL)

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Two year extensive observations of micro pulse lidar over tropical station, Chennai (12.82N, 80.04 E), India has been utilized to study the occurrence of cirrus clouds its effect on the thermal structure of tropical tropopause layer (TTL). Cirrus clouds and its top and base heights occurrences are estimated and found that they occur about ~77% of times. The occurrence of cirrus clouds shows a pronounced seasonal variation with maximum occurrence ~86% during monsoon while minimum occurrence ~41% during winter season consistent with earlier reports. Optical thickness of cirrus is also obtained using two-way transmittance method in order to distinguish different types of the cirrus clouds. Out of total, about 70% of the cirrus clouds have optical thickness less than about 0.4 and their width is found to be lesser than 2.5 km. The relationship of cirrus clouds occurrences and TTL thermal structure are investigated using Chennai IMD radiosonde operated twice a day during 05:30 IST and 17:30 IST and hourly INSAT-3D/3DR temperature collected over SRM MPL is investigated. The details of the quantitative relationship between occurrence of cirrus cloud near and TTL thermal structure will presented during the conference.

Key words: Cirrus Clouds, Tropical Tropopause Layer, Micro Pulse Lidar, INSAT 3D/3DR