

Physics Research and Technology

# Breakthrough Research and Technologies in Physics for a Sustainable Future



Koyel Ganguly  
Soumyadipta Pal  
Kamakhya Prasad Ghatak  
Editors

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## Chapter 15

# VHF Radar and Radiosonde Observations of the Tropical Tropopause

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### Abstract

In the present investigation, an attempt has been made to study the variation in tropopause height over three geographical locations: Chennai, Bangalore, and Hyderabad. The tropopause height is derived by identifying the coldest temperature in the upper troposphere and is referred to as the freezing point tropopause. The variability of cold point tropopause over different periods has been studied during the year 2002. Radiosonde and MST radar observations are made to measure the tropopause height and vertical wind variability in the vicinity of the tropopause. The Indian MST radar is installed at Gadanki (13.470°N, 79.180°E, and 0.375 km above mean sea level) near Tirupati, Andhra Pradesh. The location of the Indian MST radar is well covered by the area enclosed by the three stations mentioned above. In this communication, we conduct a comparative study of tropopause height over different time scales, including day-to-day and seasonal variations of the cold point tropopause. Finally, our analysis reveals that the vertical wind variability in the region of the tropopause indicates the existence of tropopause oscillation. Moreover, the vertical extent of the tropopause increases due to the highly developed thermal mixing and warm temperature. Furthermore, we extend our analysis to correlate the variation in

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