

**Long-term behavior of the temperature structure
in the tropical tropopause layer**

Presenter

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Related RISH mission

Mission 1

Abstract

The distinction between troposphere and stratosphere may not always occur at sharp boundary as defined by the tropopause. There is an important atmospheric layer where this distinction occurs, which has properties both of the troposphere and the stratosphere. In the tropics, this region referred to as the tropical tropopause layer (TTL). The TTL is an important source region for much of the air entering to the stratosphere. In the present study, the TTL considered between 150 hPa-70 hPa (~ 14-18.5 km). The long-term behavior of the TTL using routine radiosonde observation over Truk (7.44°N, 151.83°E), Singapore (1.03°N, 103.87°E) and Darwin (12.41°S, 130.88°E) carried out over 31 years (January 1980 to December 2010). The long-term analysis carried out using multiple regression analysis taking into account of the various atmospheric indices such as Quasi-biennial Oscillation (QBO), El Nino Southern Oscillation (ENSO), Indian Ocean Dipole (IOD), Solar cycle (SC) and aerosols due to volcanic eruptions. These atmospheric parameters has important role in the inter-annual variation of the atmospheric temperature. The lower stratosphere shows cooling trends as consistent with earlier reports. The warming trend in the troposphere is however not robust over all the stations. Darwin shows clear warming trend in the tropospheric temperature while over Singapore it is very weak. Truk shows cooling trend instead of warming in the troposphere above the altitude ~5 km. The tropospheric warming change over the altitude region ~ 10-12 km (below TTL) over Singapore while over Darwin is at altitude ~ 16-17 km (in the TTL). The above results will be presented in detail.