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The study on the short term planetary wave activity in the MLT region over Southern Hemisphere using SuperDARN HF radar

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The mesosphere lower thermosphere (MLT) region connects the middle atmosphere to the thermosphere. It is therefore a combination of physical dynamics due to forced waves from lower atmospheric layers and photochemical reactions enhanced by solar radiation. This work focuses on the influence that forced atmospheric waves (for e-g planetary waves and atmospheric tides) from lower layers have on the MLT dynamics. SuperDARN HF radar is used to study short term planetary wave activity in the MLT over southern hemisphere. The emphasis on the "short term" behaviour is motivated by the substantial work conducted on the relatively large period planetary waves (e-g 14, 16, 20, 23 and 27 day waves). Short period planetary waves in this work refer to waves ranging from quasi 2 to 6 day waves. This work will also study interactions between tides and planetary waves during minor sudden stratospheric warming (SSW) events. SSW is characterized by a rapid enhancement of stratospheric temperature that takes place, within few days, poleward from 60° latitude and at 10 hPa pressure level or below, and is followed by a deceleration and/or reversal of eastward winter winds.

We have thus far identified the years and days of interests, where minor warming events occurred. We have produced wind dynamic spectra for those years. From the dynamic spectra, extracted the wind speed amplitudes corresponding to minor warming days. The analysis that is still pending is the wavelet spectral representation of short term planetary waves and the bi-spectra plots comprising of the planetary waves and atmospheric tides so as to study the interactions. The obtained and planned results shall be presented in the conference.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD, N/A)?

MSc

Main supervisor (name and email) and his / her institution

Prof. Sivakumar Venkataraman

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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