



Lower atmospheric characteristics and Ionospheric backscatter observed using Calcutta University ST Radar (CU-STR)

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A new Stratosphere-Troposphere Radar has been installed at Ionosphere Field Station (IFS) (22.93° N, 88.50 °E geo; magnetic dip: 34°N) of University of Calcutta (CU) located about 50km north-east of the city. The main objectives of this radar are to carry out studies on tropopause convection, gravity waves, equatorial/planetary waves and ionospheric E and F region irregularities. This Radar comprises of fully active phased array having 475 Yagi antennas operating at 53 MHz, each transmitting peak power of 2kw. The location of this radar is unique being located in the transition region from the tropics to the sub-tropics and around the northern crest of Equatorial Ionization Anomaly (EIA) in the geophysically sensitive Indian longitude sector. In fact, to the best of our knowledge, no such radars are presently operational in the entire eastern and north eastern part of the country and also in the south-east Asian longitude sector. The main radar is configured into 25 sub-arrays each having 19 transmitter receiver modules. A pilot version of the main radar is operational at IFS since April 2018.

The location of Calcutta and the radar site at Haringhata offers an interesting platform for studying the dynamics of the lower atmosphere with distinctive wind velocities, Doppler width and SNR measured during Pre-monsoon and Monsoon period, often varying at different times of the day and also from one day to the next. This radar operated at a maximum duty ratio of 5% is capable of measuring various atmospheric parameters mentioned above with height resolution of 50 meters could provide vital information for convective activity and cyclone forecast. The present paper reports the three components wind velocities and other related parameters for some representative days of pre-monsoon and post-monsoon periods of 2018.

Ionospheric E-region backscattered signals are usually observed during the local summer months of May to July. Some initial RTI maps have been generated using this facility which shows operated in ionospheric mode during post sun-set hours. It shows appreciable lower height of E-region echoes often around 110km during 23:00-02:00 IST.