C-58: The structure of wind velocity in the lower atmosphere around Hambantota

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Detailed hourly measurements of surface winds have recently become available through the CEB Wind Energy Project. We take advantage of these records to characterise the structure of the wind velocity of the atmospheric surface layer around Hambantota in different climatic seasons.

The surface winds are from the North East from November to January. In the rest of the year, the winds are directed towards the South West particularly intensely around July. The "gustiness" of the wind as measured by the mean of the differences between maximum and average velocity is moderately greater during the monsoonal months. We have estimated a log-law for the velocity profile. The velocity at heights between 10 m and 20 m are highly correlated. There is a significant diurnal variation of wind velocity which averages 3-5 m/s from 2400h to 0800h. Thereafter it peaks at 7-10 m/s around 1530h. The average monthly wind velocity is directly correlated with precipitation.

These seasonal variations of wind and precipitation in Sri Lanka are clearly correlated with the latitude of the Tropical Convergence Zone which marks to meeting zone of the two Hadley cells of the tropics. The dominant mechanisms driving wind are the location of the Hadley cell and local factors such as diurnal variation and topography.

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