

Monsoon low level jet and the variation in thermal structure in wet and dry rainfall episodes over southwest India

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Variations in summer monsoon rainfall, jet streams and thermodynamical structure of lower troposphere, are examined in this study, in relation to wet and dry spells of rainfall over a coastal station Thiruvananthapuram (8.48°N , 76.95°E), Kerala. Observational and numerical analysis have been carried out on the summer monsoon variability over southwest coast of India (Western Ghats). Rainfall features and the low level circulation in this part are quite different from other parts of the southwest coast. The north-westerly low level jet at the along this region contributes the monsoon rainfall rather than the south-westerly low level jet. An attempt has been made to analyse the monsoon rainfall over Kerala along with a detailed investigation on the characteristic features of wet and dry spells of rainfall over Thiruvananthapuram for the recent years from 2010 to 2015 (except 2012). This period, however, witnessed frequent occurrence of dry spells along with long duration of dry days. Interestingly, wet spells are seen characterised by strong LLJ and weak TEJ and vice versa during dry spells. In both spells, lower levels (below 1km) and zero-degree isotherm layer (at 5 km) exhibit coherent peaks in temperatures. Frequent occurrence of warm temperatures at lower levels (below 5 km level) during dry spells are evident. The temperature peaks are distinctly different at 2 to 4 km levels, with dry spells associated with warmer temperatures (1°C to 1.5°C) than wet spells. The boundary layer, however, experiences humid condition ($> 80\%$) in both wet and dry spells. Differences are mainly reflected in mid-levels (between 2 to 10 km) where wet spells are associated with more moisture and low humid during dry spells.