Diurnal Cycle of Convective Activity Over South Asia Using Satellite Data

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The climatological features of the diurnal cycle of cloudiness were investigated over three convective centers of interest over South Asia: over the Himalayas; north India and the Bay of Bengal (BOB). Three hourly blackbody brightness temperature (TBB) data from the METEOSAT-5 and rainfall data (3B42) from the Tropical Rainfall Measuring Mission (TRMM) were utilized. Analysis was concentrated on pre-monsoon and the summer monsoon season. Two methods were used to detect cloudiness: one method counted cloud clusters (CC) and utilized cloud tracking technique to identify time clusters (TC); and the other method computed cloud cover frequency (CCF). CC was defined as a contiguous area of pixels with TBB lower than the threshold of 219 K. The CCF was derived using 235 K as the threshold. The life cycle of cloud clusters during summer monsoon season was also investigated. The diurnal cycle varied with location. There appeared a gradual delay in the preferred time of initiation, attainment of maximum area and dissipation as one progresses northward from BOB region through north India to the Himalayas.

Keywords: diurnal variation; climatology; South Asia