



## Characteristics of daily variation of rainfall over the tropics

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Characteristics of daily variation of rainfall over the tropics were studied using 14 years TRMM 3G68 data. Diurnal variation of rainfall has been studied extensively using in situ, satellite and radar data. Most studies on diurnal variation are focused on one local peak a day. We have noted on two local peaks of rainfall over southern Africa and Amazon during boreal winter from NICAM simulation and satellite observations. Our study suggests solar heating during daytime and radiation cooling during nighttime might cause the two local peaks of rainfall. The amplitude is depending on how strong the solar heating and/or radiation cooling comparing with other atmospheric conditions. Here we studied the two local peaks of rainfall over the tropics (30N-30S) with changing the area size (1.5, 2.5, 5 lat/lon grid) and season.

Basic hourly rainfall data was constructed over 0.5 lat/lon grid by averaging 14 years 3G68 data (both PR and TMI). First we select the grid where two local peaks exist. The grid is defined as second peak is larger than 20% of primary peak. Further, when we detect more than two peaks, we discard the grid. Then we applied harmonic analysis for the time series over the grid (where only two local peaks exist) to get the second amplitude. Regardless of area size and sensor (PR/TMI), we can see many grids where the two local peaks a day exist, over both ocean and land. The amplitude is slightly larger over land and larger amount of rainfall area where shifts depending on season. Most grids indicate that earlier peak corresponds to early morning and later peak corresponds to afternoon.