

Satellite and model analysis of short-term precipitation characteristics over tropical oceans

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It is well known that tropical convection is dominant phenomena on various spatial and temporal scales interacting with environment fields. Temporal characteristics of tropical convection was investigated by observational and model studies, but short-term characteristics of atmosphere related with tropical convection is not well understood. This is because that low earth orbit (LEO) satellite covering globally is coarse temporal resolution (typically twice daily) to understand temporal behavior of moist convection on a few hours. Masunaga (2012) recently demonstrated temporal evolution of moist convection over an hourly to daily time scale using temporal gap of two LEO satellites (TRMM/Aqua).

To provide observational knowledge of short-term temporal variability of tropical convection and model diagnosis, the current study was conducted to explore short-term characteristics related with convective activity using satellite observation referring to Masunaga (2012) and compare model results of different spatial resolution simulated by the Nonhydrostatic Icosahedral Atmospheric Model (NICAM).

The current study focuses on temporal variability of precipitation, brightness temperature at 11 μm related with cloud top temperature, and column water vapor. These parameters are obtained by both TRMM and Aqua satellites. Parameters are sorted as relative time from a basepoint of Aqua observation, which enables to estimate autocorrelation on an hourly time scale. These results will be compared with NICAM's results at fine and coarse horizontal resolutions.

Keywords: Convective activity, Short-term variability