Geophysical Research Abstracts, Vol. 8, 06272, 2006
SRef-ID: 1607-7962/gra/EGU06-A-06272

The detection of severe storms using eight-year of TRMM PR data

M. Hirose, S. Shimizu, R. Oki, M. Kachi, and T. Higashiuwatoko

Earth Observation Research and Application Center, Japan Aerospace Exploration Agency, Japan (hirose@eorc.jaxa.jp / Fax: +81-3-6221-9192 / Phone: +81-3-6221-9158)

Intense rainfall often triggers a natural disaster. This study dealt with the occurrence characteristics of severe storms using long-term data observed by TRMM PR. In addition, data potential of the eight-year data was examined in view of the sufficiency of the sampling and the precipitation property.

First, the usefulness of the multiple-year data was examined. The minimum number of monthly and hourly samples in the mid-latitudes was significantly increased for 8 years. It is 1.4 times more than that of 7 years, and 8 times for 3 years. For assessment of the impact of the long-term data accumulation, the detection of the diurnal signature was focused on since it needs sufficient hourly samples in fine spatial scale. We considered the significant diurnal peak based on sufficient samples as the time of maximum rainfall with consecutive positive anomalies for more than three hours. For all season during 8 years, 40 % of regions could be detected as the region with the significant diurnal signature. Looking into Tibet, 80 % of the region was detected, implying the uniform mechanism therein. The long-term data accumulation enabled us to investigate more accurate rainfall at various temporal and spatial scales, such as for the intraseasonal variation and for rare events.

By using this dataset, the spatial distribution of the high-ranked severe rain and its occurrence frequency were investigated. In order to sample multiple events with the occurrence frequency of 0.1 %, more than 300 overflights are required for 0.5 degree box. It corresponds to the observational data for about 2 years in the equatorial zone.

In addition, the impact of the tropical cyclone on total rainfall was investigated using JAXA/EORC Tropical Cyclone Database. The regional difference of the rainfall intensity over land and ocean was also examined.