



Evaluation of TRMM 3B42 Products Using a New Gauge-Based Analysis of Daily Precipitation over China

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In this study, a new gauge-based analysis of 0.25-degree daily precipitation data from 756 Chinese stations (regard as observations) developed by the 'Asian Precipitation Highly-Resolved Observational Data Integration towards Evaluation of the Water Resources (APHRODITE)' project will be used to evaluate the precipitation products from the Tropical Rainfall Measuring Mission (TRMM) merged high quality (HQ)/infrared (IR) precipitation over China during the periods 1998-2009. The main results about this study reveal that the TRMM product has a good ability to describe the observed precipitation spatial climatology and seasonal and annual variations, and the observed variability and trends for most areas of over China, especially to well describe the evolution of the summer-time rainfall belt in the Yangtze River valley. The differences between them are no more than 20% over the most areas of east China, but the TRMM product is less than the observed analysis about 20%~50% for the most western China, particularly in the Xinjiang province and the Tibetan Plateau. The TRMM product can estimate the observed heavy rainfall on a larger scale to a certain extend, but has a limitation to capture the extreme rainfall on a synoptic scale and sub-synoptic scale attributed to underestimate the rainfall magnitude for some areas over the southeast coastal areas and some Chinese islands. Therefore, the TRMM product would be cautioned to use as reference data to study the extreme rainfall event over some coastal areas islands. An Empirical Orthogonal Function (EOF) analysis shows that the TRMM products has a good ability to depict the temporal-spatial evolution of the observed rainfall for most areas of China, especially for the eastern China