

Agreement between monthly land rainfall estimates from TRMM-PR and gauge-based observations over the South Asia

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Abstract

There is a demand for reliable rainfall data-set over the South Asia region covering both land and ocean for model validation/development and various applications. For satellite rainfall estimates (SREs), the algorithm development groups also need validation information on SRE. The Tropical Rainfall Measuring Mission (TRMM) project has produced recently improved version 7 (V7) rainfall data-sets. Version 6 (V6) and V7 of 3A25, the surface rainfall products derived from TRMM precipitation radar (PR), are compared with gauge-based observations at 0.5° latitude/longitude resolution for the period of 1998–2007 over the South Asian land region. Both 3A25V7 and 3A25V6 represent the mean rainfall distribution patterns reasonably well. However, 3A25 products overestimate rainfall over the Indonesian region compared to gauge-based data. For some parts of South Asia, SREs show considerable difference in the magnitude of coefficient of variation compared to gauge-based information. At seasonal scale, a contrasting feature in bias over India during the pre-monsoon and monsoon seasons is noticed from both the versions of 3A25 data-set. In general, 3A25 rainfall data-sets are able to capture the interannual variability of rainfall over South Asia. The frequency distribution of monthly rainfall rate reveals that 3A25 products marginally underestimate rainfall below 10 mm day⁻¹ and overestimate higher rainfall rate compared to gauge-based data. Overall, 3A25V7 product is marginally better than its previous version (3A25V6) over the South Asian land region.