
Spatial and Temporal Analysis of Rain Gauge Data and TRMM Rainfall Retrievals in Hong Kong

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Abstract

Tropical Rainfall Measuring Mission (TRMM) rainfall products ((precipitation radar (PR) 2A25 and 3B42 or TMPA)) and hourly rainfall data in Hong Kong from January 1, 1998 to December 31, 2007 were used to examine the spatial and temporal rainfall structure and their relation in Hong Kong. The hourly gauge data show a spatial decorrelation distance of about 28 km. There are large inter-annual variability of satellite and gauge rain rate distributions and their relations; however, there are consistent differences in the rain rate distribution between gauge and TRMM products. Analyses of rainy pixels between gauge and PR show small biases, decreasing root mean square error, mean absolute error for increasing grid sizes. The correlation coefficients between TRMM PR and hourly gauges data improved from 0.16, 0.34, to 0.52 for 0.1, 0.2 and 0.4 degree gridded rain rates, in that order. For TMPA 3-hourly 0.5 degree rainfall rates, the correlation coefficient is 0.35, with large inter-annual variations.

Keywords

TRMM, TMPA, spatial-temporal analysis, rainfall
