Validation of satellite-derived rainfall estimates over China

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Abstract

Estimation of rainfall by satellite technology is one of valuable data production. These data need to verify for more consistent with observed data. In this study, the primary goal was to evaluate and discuss the validation of rainfall estimates from five products (i.e.3B40RT, 3B41RT, 3B42RT, CMORPH, GSMAP), at various space and time scales. These products are validated over China using the National Meteorological Information Center (NMIC) optimal interpolation rain gauge analysis as the reference standard. The spatial scale of the estimated and reference data sets is 0.25∘of latitude and longitude, and daily accumulations (00-00 U.T.C.) are used. Rain Gauge data from network of 2419 stations in China of China meteorological administration (CMA) have been used. This validation activity was conducted for 2009 at first and then continues to the real-time products. A set of WCRP validation criteria is used for quality assessment. In this study, scatter grams, error reported between the Rain gauge analysis and satellite-derived products have been assessed in China. The linear correlation coefficient, the mean absolute error, the root mean square error (RMSE), the probability of detection (POD), the false alarm ratio (FAR), the frequency bias and statistical rating also have been calculated. Data validation was conducted with point-by-point analysis and spatial average analysis. The general results of point-by-point analysis indicated satellite-derived data values of medium correlation. An result is that the 3B42RT, CMORPH and GSMAP products lead to better scores. The 3B40RT, 3B41RT products lead to slightly worse scores. The result is shown that for accurate performance assessment a single criterion is seldom sufficient. The validation effort over China is but one of several continental-scale validation efforts that have been endorsed by the International Precipitation Working Group (IPWG) to provide helpful feedback to algorithm developers who can then modify and improve their estimation techniques. A similar continental-scale validation effort is underway over America, Australia, Japan, South America and Europe. Certainly, China will provide substantial useful feedback that will help the precipitation estimation algorithm community.

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