



Contribution ID: 289

Type: Poster

Determining the appropriate altitude to improve accuracy in rainfall estimation from radar reflectivity data.

Thursday 25 May 2017 17:45 (15 minutes)

In present day, rainfall estimation by weather radar is widely used. Meteorologists use various z-r relationships to appropriate rainfall estimation for different study areas which have different factors such as topography, climate, rain pattern, types of clouds, etc. This research aims to determine the appropriate altitude of radar reflectivity (Z-Level) to provide accurate rainfall estimation. This research will use radar reflectivity data (Z) from Omkoi radar station, which is owned by the Department of Royal Rainmaking and Agricultural Aviation (DRRAA). It uses radar reflectivity data from 1.5 to 13.5 kilometers above mean sea level. We convert it to daily rainfall from radar (R) using Omkoi Z-R relationship ($Z=92.4R^{1.5}$) and compare the result to daily rainfall measured by rain gauge stations (G) from 42 rain gauge stations of Thai Meteorological Department (TMD), covering areas within radius of Omkoi radar station (240 km) in the northern of Thailand. The study will consider comparing various statistics of rainfall from radar (R) and rainfall from rain gauges (G), such as correlation coefficients, root mean square error (RMSE) and the characteristic distribution of graphs (Scatter Plot). The results show that the radar reflectivity data in altitude 3.5 km above mean sea level are the most suitable to be used to determine the Z-R Relationship. Therefore, determination of Z-R relationship of Omkoi radar station should be based on the radar reflectivity data at altitude 3.5 km above mean sea level.

Keywords : Z-R Relationship, Rainfall Estimation, Weather Radar, Radar Reflectivity, Rain gauge, Altitude, Correlation Coefficient, Root Mean Square Error, RMSE, Scatter Plot

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Session Classification: Poster Presentation II

Track Classification: Environmental Physics, Atmospheric Physics, Geophysics and Renewable Energy