



Contribution ID: 318

Type: Poster

Rainfall Estimation from Radar in different seasons over Northern Thailand

Thursday, May 25, 2017 5:45 PM (15 minutes)

Abstract

Thailand was under the influence two types of monsoon winds, Northeast monsoon and Southwest monsoon. The Northeast monsoon (October –February) brings the cold and dry air from China to cover the major parts of Thailand. The Southwest monsoon (May –October) brings a stream of warm moist air from Indian Ocean towards Thailand causing abundant rain over the country. The objective of the research is to evaluate Z-R relationship ($Z = aR^b$) for rainfall estimation in different monsoons.

This study use reflectivity data from Omkoi radar station in Chaing Mai Thailand and rainfall data in radius of 240 km (42 stations) from Omkoi weather radar station from Thai Meteorological Department in 2015. Method for matching reflectivity data (Z) and rainfall rate (R) relationship are PMM (Probability Matching Method) and Statistics comparison by RMSE (Root Mean Square Error), correlation coefficient and scatter plot of mean radar rainfall and mean gauge rainfall. We find that the Z-R relationship in rainy season (May –October) is $Z = 103.83R^{1.5082}$ and the Z-R relationship in non- rainy season (November –December, January –April) is $Z = 102.18R^{1.4512}$. For the same rainfall intensity, reflectivity value in non –rainy season is higher than in the rainy season. Considering the statistics and graphs distribution.

It is obvious that the correlation coefficient in the rainy season are higher than during the non- rainy season. This research shows that each monsoon causes a different type of rain. Thus rainfall estimation for each monsoon should be based on different Z-R relationship for more accuracy.

Key-word: Rainfall, Z-R Relationship, Monsoon, Radar, Rainfall estimation

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Session Classification: Poster Presentation II

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