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Analysis of the synthetic storm technique using rain height models to predict rain attenuation in tropical regions (Conference Paper)

Lwas, A.K.^a, Islam, M.R.^a , Habaebi, M.H.^a, Ismail, A.F.^a, Abdullah, K.^a, Zyoud, A.^a, Chebil, J.^b, Singh, M.^c^a Department of Electrical and Computer Engineering, International Islamic University Malaysia, Malaysia^b Department of Technology and Engineering in Transport, University of Sousse, Tunisia^c Faculty of Engineering, University Kebangsaan Malaysia, Malaysia[View additional affiliations](#)[View references \(9\)](#)

Abstract

This paper aims to investigate the utilization of the **Synthetic Storm Technique (SST)** to convert **rain rate** time series to **rain attenuation** time series using the ITU-R P.839, Stutz man and Bryant **rain height models**. Furthermore, the study aims to compare the actual **rain attenuation** with that predicted by the SST using the three above-mentioned **rain height models** based on **rain rate** and **rain attenuation** both measured concurrently. The study relies on **rain rate** time series and **rain attenuation** time series measured at University Science Malaysia (USM) campus (4.390 N, 100.980 E). The study found that the higher the **rain rate**, the higher is the percentage error for the SST predicated **rain attenuation** using the three above-mentioned **rain height models** as compared with measured **rain attenuation**. However, it is observed that when the Stutz man **model** applied as part of the SST **model**, the prediction is more accurate of the three **rain height models**. © 2014 IEEE.

Author keywords

rain attenuation time series; **rain height models**; **rain rate** time series; **Synthetic Storm Technique**

Indexed keywords

Engineering controlled terms: Electromagnetic wave **attenuation**; Infiltration; Satellite communication systems; **Storms**; Time seriesPercentage error; **Rain attenuation**; **Rain attenuation** time series; **Rain height**; **Rain rates**; **Sst models**; **Synthetic storm technique**; **Tropical regions****Engineering main heading:** **Rain**

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