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## Fade Margin Estimations for Malaysian Armed Forces Military X-Band Satellite Communication Links

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INTERNATIONAL JOURNAL OF FUTURE GENERATION COMMUNICATION AND NETWORKING

Volume: 11 Issue: 3 Pages: 1-9

DOI: 10.14257/ijfgcn.2018.11.3.01

Published: MAY 2018

Document Type: Article

### Abstract

The satellite communication (satcom) operating in X-band frequencies has the potential to enhance communication capabilities of Malaysian Armed Forces (MAF) and the Malaysian National Security Council (NSC). The satcom can be deployed during catastrophic instances, crisis incidences and certainly for the use of military operations. The satcom can facilitate the delivery of critical high-speed data, voice and video services between military bases, headquarters and also military detachments. The paper highlights the predicted fade margin requirements by the Malaysian Military satellite communication in order to accomplish specific operational quality of services (QoS). This is of utmost importance considering that both the uplink and the downlink will be facing severe rain attenuation due to copious heavy rainfall events, typically endured by tropical region countries. A prediction technique, recommendation ITU-R P. 618-12 with value proposed by ITU-R P. 637-6 had been employed in order to generate the desired results. Local data acquired from the Department of Irrigation and Drainage Malaysia had also been utilized in the generation of the fade margin estimations. The findings from the studies can offer insight of how to ensure/ enhance the satellite communication links reliability.

### Keywords

**Author Keywords:** Rain attenuation; X-band; satcom; tropical region

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### Funding

Funding Agency	Grant Number
Research Management Centre of International Islamic University Malaysia (IIUM)	

#### Close funding text

The authors express thanks the Research Management Centre of International Islamic University Malaysia (IIUM) for the financial assistance and would like to express special appreciation to Malaysian Armed Forces of MATM-Bahagian Komunikasi dan Elektronik (KOMLEK) for the technical guidance and assistance in the collaboration that makes the analysis possible.

### Publisher

SCIENCE & ENGINEERING RESEARCH SUPPORT SOC, RM 402, MAN-JE BLDG, 449-8 OJUNG-DONG, DAEDOEK-GU, DAEJON, 00000, SOUTH KOREA

### Categories / Classification

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