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Investigation of the unified rain attenuation prediction method with data from tropical climates (Article)

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Abstract

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The semi-empirical method recently proposed by Silva Mello and Pontes (SMP) for the prediction of rain attenuation in slant paths is investigated in this letter. The SMP method uses the simplified model of equivalent rain cell and the concept of an effective rain rate. However, substantial deviations were observed in SMP predictions when compared to the rain cell diameters derived from experimental data. The measured rain rates and attenuations were obtained from three tropical climates (Australia, and USM and IIUM both in Malaysia). The measured rain attenuation complementary cumulative distributions (CCDs) were also compared to SMP and the Rec. ITU-R P. 618-11. The test results show that the ITU-R model performs much better compared to SMP method in the three tropical climates. © 2002-2011 IEEE.

Author keywords

Correction factor effective rain height ITU-R 618-11 rain attenuation complementary cumulative distribution (CCD)
 rain cell diameter Silva Mello and Pontes (SMP) method tropical climates

Indexed keywords

Engineering controlled terms: Electromagnetic wave attenuation Rain Tropics

- Complementary cumulative distributions
- Correction factors
- ITU-R 618-11
- Rain cells
- Rain height
- Silva Mello and Pontes (SMP) method
- Tropical climates


Engineering main heading: Climate models

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 Obiyemi, O.O. , Ibiyemi, T.S. , Ojo, J.S.
(2017) Theoretical and Applied Climatology

Frequency diversity improvement factor for rain fade mitigation in Malaysia
 Rafiqul, I.M. , Altajjar, M.L. , Habib, M.S.
(2016) 2015 IEEE International WIE Conference on Electrical and Computer Engineering, WIECON-ECE 2015

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DOI: 10.1109/LAWP.2014.2329778
Document Type: Article
Publisher: Institute of Electrical and Electronics Engineers Inc.

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Andrade, F.J.A. , Cruz, P.A. , Da Silva Mello, L.A.R.
 (2015) *SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference Proceedings*

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- 1 Crane, R.K.
Prediction of Attenuation by Rain
 (1980) *IEEE Transactions on Communications*, 28 (9), pp. 1717-1733. Cited 317 times.
 doi: 10.1109/TCOM.1980.1094844
 View at Publisher
-
- 2 Islam, R.M.D., Abdulrahman, Y.A., Rahman, T.A.
An improved ITU-R rain attenuation prediction model over terrestrial microwave links in tropical region
 (2012) *Eurasip Journal on Wireless Communications and Networking*, 2012, art. no. 189. Cited 12 times.
 doi: 10.1186/1687-1499-2012-189
 View at Publisher
-
- 3 Abdulrahman, A.Y., Rahman, T.A., Olufeagba, B.J., Rafiqul Islam, M.D.
Using full rainfall rate distribution for rain attenuation predictions over terrestrial microwave links in Malaysia
 (2013) *Signal Process. Res.*, 2, pp. 25-28.
 Mar.
-
- 4 Abdulrahman, A.Y., Rahman, T.A., Rahim, S.K.A., Islam, Md.R., Abdulrahman, M.K.A.
Rain attenuation predictions on terrestrial radio links: Differential equations approach
 (2012) *Transactions on emerging telecommunications technologies*, 23 (3), pp. 293-301. Cited 8 times.
[http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)1541-8251/issues](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1541-8251/issues)
 doi: 10.1002/ett.1531
 View at Publisher
-
- 5 Moupfouma, F.
Rain induced attenuation prediction model for terrestrial and satellite-Earth microwave links
 (1987) *Annales Des Télécommunications*, 42 (9-10), pp. 539-550. Cited 13 times.
 doi: 10.1007/BF02994985
 View at Publisher
-
- 6 Nalinggam, R., Ismail, W., Mandeep, J.S.
Comparison of rain attenuation prediction models with ground measurement data for Penang
 (2011) *IET Microwaves, Antennas and Propagation*, 5 (13), pp. 1546-1551. Cited 5 times.
 doi: 10.1049/iet-map.2011.0144
 View at Publisher

-
- 7 Badron, K., Ismail, A.F., Islam, M.R., Abdullah, K., Din, J., Tharek, A.R.
A modified rain attenuation prediction model for tropical V-band satellite earth link

(2015) *International Journal of Satellite Communications and Networking*, 33 (1), pp. 57-67. Cited 4 times.
[http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)1542-0981](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1542-0981)
doi: 10.1002/sat.1071

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-
- 8 (2001) *Rain Height Model for Prediction Methods*. Cited 103 times.
ITU-R Geneva Switzerland Recommendation ITU-R P.839-3 Sep.
-
- 9 (2013) *Propagation Data and Prediction Methods Required for the Design of Earth-space Telecommunications Systems*. Cited 343 times.
ITU-R Geneva Switzerland Recommendation ITU-R P. 618-11, Sep.
-
- 10 Da Silva Mello, L., Pontes, M.S.
Unified method for the prediction of rain attenuation in satellite and terrestrial links

(2012) *Journal of Microwaves, Optoelectronics and Electromagnetic Applications*, 11 (1), pp. 1-14. Cited 14 times.
<http://www.jmoe.org/download.php?file=13262251500.pdf&nome=Volume11-Number1-UnifedMethodforthePredictionofRainAttenuationinSatelliteandTerrestrialLinks.pdf>
-
- 11 Ramachandran, V., Kumar, V.
Modified rain attenuation model for tropical regions for Ku-Band signals

(2007) *International Journal of Satellite Communications and Networking*, 25 (1), pp. 53-67. Cited 33 times.
doi: 10.1002/sat.846

View at Publisher
-
- 12 Geneva Switzerland, I.
Specific attenuation model for rain for use in prediction methods
(2005) *Recommendation ITU-R P.*, 838 (3).
Mar.
-
- 13 Dao, H., Islam, M.R., Al-Khateeb, K.
Modification of ITU-R rain fade slope prediction model based on satellite data measured at high elevation angle
(2012) *IJUM Eng. J.*, 12 (5), pp. 53-59. Cited 11 times.
-
- 14 (2009) *Acquisition, Presentation and Analysis of Data in Studies of Tropospheric Propagation*. Cited 29 times.
ITU-R Geneva Switzerland Recommendation ITU-R P. 311-13 Oct.
-

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