

PROF. TJO AFULLO - RECENT PUBLICATIONS

Journal Papers (2014-2020):

- Djuma Sumbiri and Thomas JO Afullo, "Optimized Rain Drop Size Distribution Model for Microwave Propagation for Equatorial Africa," *SAIEE Africa Research Journal*, Vol. 111, No.1, March 2020, pp22-35.
- Steven O Awino, Thomas JO Afullo Modisa Mosalaosi, and Peter O. Akuon, "Measurements and Statistical Modelling for Time Behaviour of PowerLine Communication Impulsive Noise," *International Journal on Communications Antenna and Propagation*, Vol. 9, May 2019
- Nicholas O. Oyie and Thomas JO Afullo, "Spatiotemporal Statistical Channel Model for Indoor Corridor at 14 GHz, 18 GHz, and 22 GHz Bands," *Wireless Communications and Mobile Computing*, Volume 2018, Article ID 9656029, 10 pages, <https://doi.org/10.1155/2018/9656029>
- Babajide Afolayan, Thomas Afullo and Akintunde Alonge, "Subtropical Rain Attenuation Statistics on 12.6 GHz KU-Band Satellite Link Using Synthetic Storm Technique," *SAIEE Africa Research Journal*, Vol. 109, No.4, December 2018, pp230-236.
- Steven O Awino, Thomas JO Afullo Modisa Mosalaosi, and Peter O. Akuon, "Time Series Analysis of Impulsive Noise in Power Line Communication (PLC) Networks," *SAIEE Africa Research Journal*, Vol. 109, No.4, December 2018, pp237-249
- M. N. Ahuna, T. J. Afullo and A.A. Alonge, "Outage Prediction During Intense Rainstorm Events Using Queuing Theory and Markov Chains Over Radio Links," *Progress In Electromagnetics Research M*, Vol. 73, 183–196, 2018.
- Nicholas O. Oyie and Thomas JO Afullo, "Measurements and Analysis of Large-Scale Path Loss Model at 14 and 22 GHz in Indoor Corridor," *IEEE Access*, Volume 6, pages 17205 – 17214, February 2018, ISSN: 2169-3536.
- Babajide Afolayan, Thomas Afullo and Akintunde Alonge, "Seasonal and Annual Analysis of Slant Path Attenuation over a 12 GHz Earth-Satellite Link in Subtropical Africa," *International Journal on Communications Antenna and Propagation*, Vol. 7, December 2017.
- Okikiade A. Layioye, Thomas J. O. Afullo, Pius A. Owolawi, "Performance Analysis of FSO Communication Systems with Higher-Order Spatial Diversity Schemes Using BPSK-SIM over Log-Normal Atmospheric Turbulence Channels," *Journal of Communications* Vol. 12, No. 6, pp 312-327, June 2017.
- M. O. Asiyo and T.J.O. Afullo, "Analysis of Bursty Impulsive Noise in Low-Voltage Indoor Power Line Communication Channels: Local Scaling Behaviour," *SAIEE Africa Research journal*, Vol 108, No.3, September 2017.
- Modisa Mosalaosi and Thomas J. O. Afullo, "Channel Modeling for High-Speed Indoor Powerline Communication Systems: The Lattice Approach," *Annals of Telecommunications*, Volume 72, [Issue 7–8](#), pp 499–511, August 2017.
- Modisa Mosalaosi and Thomas J. O. Afullo, "Broadband Characteristics for Multi-Path Power Line Communication Channels: Indoor Environments," *International Journal on Communications Antenna and Propagation*, Vol. 6, N. 4 ISSN 2039 – 5086, pp 244-254, August 2016
- D. Sumbiri, T.J. Afullo and A.A. Alonge, "Rainfall Zoning and Rain Attenuation Mapping for Microwave and Millimetric Applications in Central Africa," *International Journal on Communications Antenna and Propagation*, Vol. 6, N. 4 ISSN 2039 – 5086, pp198-210, August 2016
- F. D. Diba, T. J. Afullo and A. A. Alonge, "Rainfall Rate and Attenuation Performance Analysis at Microwave and Millimetre Bands for the Design of Terrestrial Line-of-Sight Radio Links in Ethiopia," *SAIEE Africa Research journal*, Vol 107, No.3, September 2016, pp 177-186.

- M. N. Ahuna, T. J. Afullo and A.A. Alonge, "30-Second and One-Minute Rainfall Rate Modelling and Conversion for Millimetric Wave Propagation in South Africa," *SAIEE Africa Research journal*, Vol 107, No.1, March 2016, pp 17-29.
- A. Alonge and TJO Afullo, "Rainfall time series synthesis from queue scheduling of rain event fractals over radio links," *Radio Science*, 50, doi:10.1002/2015RS005791, 2015, pg 1209-1224.
- A. Alonge and TJO Afullo, "Fractal Analysis of Rainfall Event Duration for Microwave and Millimetric Networks: Rain Queueing Theory Approach," *IET Microwaves, Antennas, and Propagation*, Volume 9, Issue 4, pp291-300, 2015.
- A.A. Alonge and TJ Afullo, "Characteristics of Rainfall Queues for Rain Attenuation Studies over Radio Links at Subtropical and Equatorial Africa," *Radio Sci.*, 49, doi:10.1002/2014RS005424, Volume 49, Issue 8, pages 583–596, August 2014.
- A. Alonge and TJO Afullo, "Rainfall Microstructural Analysis for Microwave Link Networks: Comparison at Equatorial and Subtropical Africa," *Progress in Electromagnetic Research, PIER B*, Vol. 59, page 45-58, 2014, Online ISSN: 1937-8718.
- O. Adetan and TJO Afullo, "The Influence of Disdrometer Channels on Specific Attenuation Due to Rain Over Microwave Links in Southern Africa," *SAIEE Africa Research Journal*, Vol. 105, No.1, March 2014, pp 31-40.
- SJ Malinga, PA Owolawi, TJO Afullo, "Determination of Specific Rain Attenuation using Different Total Cross Section Models for Southern Africa," *SAIEE Africa Research Journal*, Vol. 105, No.1, March 2014, pp 20-30.
- Fulatsa Zwane and T.J Afullo, "An Alternative Approach in Power Line Communication Channel Modeling," *Progress in Electromagnetic Research, PIER C*, Vol. 47, page 85-93, 2014, Online ISSN: 1937-8718.
- O. Adetan and T.J Afullo, "Raindrop size distribution and rainfall attenuation modeling in equatorial and subtropical Africa: the critical diameters," *Annals of Telecommunications*, January 2014, Online ISSN:1958-9395.

Conference Publications (2014-2020):

- O. Kolawole, TJO Afullo, M. Mosalaosi, "Initial Modeling of Atmospheric Turbulence Effect on Optical Wireless Communication Links in South Africa," Proceedings of *the South African Telecommunication and Network Application Conference (SATNAC)*, Fairmont Zimbali Resort, Ballito, KwaZulu-Natal, South Africa, September 2019, pp68-73.
- Steven O. Awino, Thomas J. O. Afullo, Modisa Mosalaosi and Peter O. Akuon, "On the Application of Periodic Autoregressive Models to PLC Impulsive Noise," Proceedings of *the South African Telecommunication and Network Application Conference (SATNAC)*, Fairmont Zimbali Resort, Ballito, KwaZulu-Natal, South Africa, September 2019, pp68-73.
- O. Kolawole, TJO Afullo, M. Mosalaosi, "Estimation of Optical Wireless Communication Link Availability Using Meteorological Visibility Data for Major Locations in South Africa," In Proceedings of *Progress of Electromagnetics Research Symposium (PIERS)*, Rome, Italy, July 2019. <https://ieeexplore.ieee.org/xpl/conhome/8977603/proceeding>, pp319-324.
- Steven O. Awino, Thomas J. O. Afullo, Modisa Mosalaosi and Peter O. Akuon, "GMM Estimation and BER of Bursty Impulsive Noise in LowVoltage PLC Networks," In Proceedings of *Progress of Electromagnetics Research Symposium (PIERS)*, Rome, Italy, July 2019. <https://ieeexplore.ieee.org/xpl/conhome/8977603/proceeding>, pp1828-1833.

- O. Kolawole, TJO Afullo, M. Mosalaosi, "Initial Estimation of Scintillation Effect on Free Space Optical Links in South Africa," Proceedings of *IEEE AFRICON 2019 Conference, Accra, Ghana*, September 2019. eCF Paper Id: ICEEA2019-148.
- Mary Ahuna and TJO Afullo, "Fade Slope Prediction Model for Rain Storms over Sub-tropical Africa," Proceedings of *IEEE AFRICON 2019 Conference, Accra, Ghana*, September 2019. eCF Paper Id: ICEEA2019-91.
- NO Oyie and TJO Afullo, "Characterization of Indoor Corridor Multipath Propagation Channel at 14 GHz, 18 GHz and 22 GHz Bands," Proceedings of Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2018, Arabella, Hermanus, Western Cape, South Africa, 2 - 5 September 2018, pp354-359.
- F Chelangat, TJO Afullo, M Mosalaosi, "**Impedance Bidirectional Adaptive Coupler for Broadband PLC**," Proceedings of Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2018, Arabella, Hermanus, Western Cape, South Africa, 2 - 5 September 2018, pp366-371.
- MN Ahuna and TJO Afullo, "**Rain Fade Duration Statistics over Ku-band Radio Link in Sub-tropical South Africa**," Proceedings of Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2018, Arabella, Hermanus, Western Cape, South Africa, 2 - 5 September 2018, pp434-439.
- AA Alonge and TJO Afullo, "Queue Arrival Characteristics of Catenated Rainfall Cells over Wireless Radio Links," IEEE Radio 2018 Conference, 15 – 18 October 2018, Hilton Resort and Spa Wolmar, Mauritius.
- AA Alonge and TJO Afullo, "Service Aggregation in Motional Rainfall Cell Queues over Wireless Radio Links," IEEE Radio 2018 Conference, 15 – 18 October 2018, Hilton Resort and Spa Wolmar, Mauritius.
- MN Ahuna, TJ Afullo, AA Alonge, "Specific rain attenuation dependence on rain storm magnitudes and measured drop sizes," IEEE Radio 2018 Conference, 15 – 18 October 2018, Hilton Resort and Spa Wolmar, Mauritius.
- MN Ahuna and TJO Afullo, "Effects of Storm Attenuation over Satellite Links in Sub-tropical Africa," Progress in Electromagnetics Research Symposium (PIERS) 2018 Toyama, Japan, 1 - 4 August, 2018.
- NO Oyie and TJO Afullo, "A Comparative Study of Dual-slope Path Loss Model in Various Indoor Environments at 14 to 22 GHz," Progress in Electromagnetics Research Symposium PIERS 2018 Toyama, Japan, 1 - 4 August, 2018.
- NO Oyie and TJO Afullo, "An Empirical Approach to Omnidirectional Path Loss and Line-of-sight Probability Models at 18 GHz for 5G Networks," Progress in Electromagnetics Research Symposium (PIERS) 2018 Toyama, Japan, 1 - 4 August, 2018.
- M Mosalaosi and TJO Afullo, "Determination of Critical Paths for Multipath Propagation in Broadband Powerline Communication Networks," Progress in Electromagnetics Research Symposium (PIERS) 2018 Toyama, Japan, 1 - 4 August, 2018.
- M Mosalaosi and TJO Afullo, "Analysis of Inter-Bundle Crosstalk in High Speed MIMO Signalling in Powerline Communication Channels," Progress in Electromagnetics Research Symposium (PIERS) 2018 Toyama, Japan, 1 - 4 August, 2018.
- SO Awino, TJO Afullo, M Mosalaosi, and PO Akuon, "Empirical Identification of Narrowband Interference in Broadband PLC Networks at the Receiver," Progress in Electromagnetics Research Symposium (PIERS) 2018 Toyama, Japan, 1 - 4 August, 2018.
- F Chelangat, TJO Afullo, M Mosalaosi, "Impedance Modelling, Profiling and Characterisation of the Powerline Communication Channel," Progress in Electromagnetics Research Symposium (PIERS) 2018 Toyama, Japan, 1 - 4 August, 2018.

- O.A. Layioye, T.J. O. Afullo, and P. A. Owolawi, "Visibility Range Distribution Modeling for Free Space Optical Link Design in South Africa: Durban as Case Study," PIERS Singapore, 19–22 November 2017, pages 2732-2741. <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8293601>.
- Djuma Sumbiri, Thomas J. O. Afullo, and Akintunde A. Alonge, "Modelling of Rain Drop Size Distribution for Microwave and Millimeter Wave in Central Africa," 2017 Progress In Electromagnetics Research Symposium — Fall (PIERS — FALL), Singapore, 19–22 November 2017, pp 2398-2404. <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8293539>.
- MN Ahuna, TJ Afullo, AA Alonge, "Rainfall fall rate prediction based on artificial neural networks for rain fade mitigation over earth-satellite link," IEEE AFRICON 2017 Conference, Cape Town, 18-20 Sept. 2017.
- BO Afolayan, TJ Afullo, AA Alonge, "A generalized analysis of attenuation-precipitation time lapse events on earth-satellite microwave link," IEEE AFRICON 2017 Conference, Cape Town, 18-20 Sept. 2017.
- GN Mazibuko, TJ Afullo, AA Alonge, "[Effects of lower sampling interval on rainfall queue characteristics over radio links in South Africa](#)," IEEE AFRICON 2017 Conference, Cape Town, 18-20 Sept. 2017.
- Djuma Sumbiri, Thomas Afullo and Akintunde Alonge (2016, September), "Geoclimatic Factor estimation for Central Africa," presented at *the South African Telecommunication and Network Application Conference (SATNAC)*, Hermanus, South Africa.
- O. Kolawole, TJO Afullo, P. Owolawi, "Performance Analysis of Cross M-QAM over Weak Atmospheric Turbulence Channel," presented at *the South African Telecommunication and Network Application Conference (SATNAC)*, Hermanus, South Africa, September 2016.
- H. Ogunmodede, TJO Afullo, P. Owolawi, "Performance Evaluation of OFDM-FSO Communication Systems using M-QAM and BPSK Modulation under Log-Normal Channel," presented at *the South African Telecommunication and Network Application Conference (SATNAC)*, Hermanus, South Africa, September 2016.
- Babajide Afolayan, Thomas Afullo and Akintunde Alonge (2016, September), "Dynamics of Reception Outage due to Subtropical Rainfall on a Satellite TVRO Link," presented at *the South African Telecommunication and Network Application Conference (SATNAC)*, Hermanus, South Africa.
- E. Orumuense, TJO Afullo, S. Srivastava, "Improving Energy Efficiency in Cognitive Radio Networks using a 2-step Cooperative Spectrum Sensing Approach," presented at *the South African Telecommunication and Network Application Conference (SATNAC)*, Hermanus, South Africa, September 2016.
- O. Layioye, TJO Afullo, P. Owolawi, "Calculations of the Influence of Diverse Atmospheric Turbulence Conditions on Free Space Optical Communication Systems Using the BPSK-SIM over the Gamma-Gamma Model," presented at *the South African Telecommunication and Network Application Conference (SATNAC)*, Hermanus, South Africa, September 2016.
- O. Layioye, TJO Afullo, P. Owolawi, "Variation of Altitude on the Variance of Angle of Arrival Fluctuations for Beam Propagation in Free Space Optical Communications," 2016 International Conference on Advances in Computing and Communication Engineering (ICACCE), Durban, 28-29 November 2016, pp 117-122.
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- Akintunde Alonge and Thomas Afullo (2016, August), "60 GHz Millimeter-Wave Radio in South Africa: Link Design Feasibility and Prospects," *Poster presented at the 37th PIERS conference* in Shanghai, China, Aug. 8-11.
- M.O. Asiyo and T.J.O. Afullo, "Multifractal Analysis of Bursty Impulsive Noise in Low-Voltage Indoor Power Line Channels," in Proceedings Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2016, 4 - 7 September 2016, Fancourt Hotel, George, Western Cape, South Africa, ISBN: 978-0-620-67151-4.
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- M.O. Asiyo and T.J.O. Afullo, "Prediction of Long-Range Dependence in Cyclostationary Noise in Low-Voltage PLC Networks," in Proceedings of Progress in Electromagnetic Research Symposium (PIERS) 2016, 8-11 August 2016, Shanghai, China.
- S.O. Awino and T.J.O. Afullo, "Measurements and Multipath Characterization of Power Line Communication Channel," in Proceedings Southern Africa Universities Power Engineering Conference (SAUPEC) 2016, 26 - 29 January 2016, Vaal University of Technology, Gauteng, South Africa, pp 353-360, ISBN: 978-0-620-67151-4.
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- Mary N. Ahuna, Thomas J. Afullo, Akintunde A. Alonge, "30-Second Integration Time Power Law Conversion Model for Rainfall Attenuation in South Africa," Third International Conference on Communications, Connectivity, Convergence, Content and Cooperation, Hyderabad, India, 13-16 December 2015.
- Feyisa D. Diba and T.J. Afullo, "Estimation of Rain Attenuation over Microwave and Millimeter Bands for Terrestrial Radio Links in Ethiopia," Proceedings of the 12th IEEE AFRICON Conference, Addis Ababa, Ethiopia, 14-17th September 2015, pp 118-122, ISSN 2153-0025.
- A.M. Nyete, T.J.O. Afullo, I.E. Davidson, "Statistical analysis and characterization of low voltage power line noise for telecommunication applications," Proceedings of the 12th IEEE AFRICON Conference, Addis Ababa, Ethiopia, 14-17th September 2015, pp 213-217, ISSN 2153-0025.
- A.A. Alonge and TJO Afullo, "Approximate Queue Scheduling for Rainfall Synthesis over Radio links in Subtropical Regions," Proceedings of the 12th IEEE AFRICON Conference, Addis Ababa, Ethiopia, 14-17th September 2015, pp 278-282, ISSN 2153-0025.
- M. Mosalaosi and T.J.O. Afullo, "A Deterministic Channel Model for Multi-Access Broadband Powerline Communication," Proceedings of the 12th IEEE AFRICON Conference, Addis Ababa, Ethiopia, 14-17th September 2015, pp 339-343, ISSN 2153-0025.
- E.F. Urumwense, T.J.O. Afullo, and V. Srivastava, "Secondary User Energy Consumption in Cognitive radio Networks," Proceedings of the 12th IEEE AFRICON Conference, Addis Ababa, Ethiopia, 14-17th September 2015, pp 87-91, ISSN 2153-0025.

- B. O. Afolayan and T.J.O. Afullo, "Slant path Rain Depolarization at Linearly Polarized Microwave Links in Durban, South Africa," in Proceedings Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2015, 6 - 9 September 2015, Arabella, Hermanus, Western Cape, South Africa, pp 41-46, ISBN: 978-0-620-67151-4.
- A.M. Nyete, T. J. O. Afullo, I.E. Davidson, "On the application of non-parametric estimation methods for low voltage PLC network noise modelling," in Proceedings Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2015, 6 - 9 September 2015, Arabella, Hermanus, Western Cape, South Africa, pp 59-64, ISBN: 978-0-620-67151-4.
- M. Mosalaosi and T.J.O. Afullo, "Analysis of Broadband Power Line Communications Noise for Indoor Environments," in Proceedings Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2015, 6 - 9 September 2015, Arabella, Hermanus, Western Cape, South Africa, pp 71-74, ISBN: 978-0-620-67151-4.
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- A. M. Nyete, T. J. O. Afullo, and Davidson, I.E., "Intra-building Power Network Noise Modelling in South Africa," *Proceedings of the 23rd Southern African Universities Power Engineering Conference*, University of Johannesburg, Johannesburg, South Africa, 28-30th January 2015, pp. 468-472, ISBN 978-0-86970-786-9 .
- A. M. Nyete, T. J. O. Afullo, and I.E. Davidson, "Statistical Models of Noise Distribution in Broadband PLC Networks," *Proceedings of PIERS 2015 in Prague*, July 6-9 2015, Prague, Czech Republic, pp. 419-425, ISSN 1559-9450.
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- **Abraham M. Nyete** and T. J. O. Afullo, "On Rayleigh Approximation of the Multipath PLC Channel: Broadband Through the PLC Channel," *Proceedings of Southern Africa Telecommunications Networks & Applications Conference 2014*, Port Elizabeth, South Africa, pp.265-270, ISBN 978-0-620-61966-0.
- **Akintunde A. Alonge** and Thomas J. Afullo (2014), Rainfall Cell Estimation and Attenuation Studies for Radio links at Subtropical Africa, Presented at the South African Telecommunication and Network Application Conference (SATNAC), August 31- September 3, 2014.

- **Modisa Mosalaosi** and Thomas J. O. Afullo, “Dispersive Characteristics for Broadband Indoor Power-Line Communication Channels”, *Southern Africa Telecommunication Networks and Applications Conference (SATNAC)*, Port Elizabeth, South Africa, Aug. 30 – Sep. 03, 2014
- **M. Mosalaosi**, Thomas J. O. Afullo, “Broadband Analysis and Characterization of Noise for In-Door Power-Line Communication Channels”, *Progress In Electromagnetics Research Symposium Proceedings (PIERS)*, Guangzhou, China, Aug. 25-28, 2014, pp. 719-723.
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