DAFTAR PUSTAKA

[1] F. Conceição, M. Gomes, V. Silva, R. Dinis, A. Silva, and D. Castanheira, "A Survey Of Candidate Waveforms For Beyond 5G Systems," *Electronics (Switzerland)*, vol. 10, no. 1, pp. 1–26, Jan. 2021, doi: 10.3390/electronics10010021.

[2] A. J. Ramadhan, "Overview and Comparison of Candidate 5G Waveforms: FBMC, UFMC and F-OFDM," *International Journal of Computer Network and Information Security*, vol. 14, no. 2, pp. 27–38, Apr. 2022, doi: 10.5815/ijcnis.2022.02.03.

[3] M. S. Sim, Y. G. Lim, S. H. Park, L. Dai, and C. B. Chae, "Deep Learning-Based mmWave Beam Selection for 5G NR/6G with Sub-6 GHz Channel Information: Algorithms and Prototype Validation," *IEEE Access*, vol. 8, pp. 51634–51646, 2020, doi: 10.1109/ACCESS.2020.2980285.

[4] A. Esmaeily, H. V. K. Mendis, T. Mahmoodi, and K. Kralevska, "Beyond 5G Resource Slicing with Mixed-Numerologies for Mission Critical URLLC and eMBB Coexistence," *IEEE Open Journal of the Communications Society*, vol. 4, pp. 727–747, 2023, doi: 10.1109/OJCOMS.2023.3254816.

[5] H. Yin, L. Zhang, and S. Roy, "Multiplexing URLLC Traffic within eMBB Services in 5G NR: Fair Scheduling," *IEEE Transactions on Communications*, vol. 69, no. 2, pp. 1080–1093, Feb. 2021, doi: 10.1109/TCOMM.2020.3035582.

[6] L. M. Campos *et al.*, "Reference Scenarios and Key Performance Indicators for 5G Ultra-dense Networks," in *2020 12th International Symposium on Communication Systems, Networks and Digital Signal Processing, CSNDSP 2020*, Institute of Electrical and Electronics Engineers Inc., Jul. 2020. doi: 10.1109/CSNDSP49049.2020.9249513.

[7] A. Sufyan, K. B. Khan, O. A. Khashan, T. Mir, and U. Mir, "From 5G to beyond 5G: A Comprehensive Survey of Wireless Network Evolution, Challenges, and Promising Technologies," *Electronics (Switzerland)*, vol. 12, no. 10, May 2023, doi: 10.3390/electronics12102200.

[8] B. A. Adoum, K. Zoukalne, M. S. Idriss, A. M. Ali, A. Moungache, and M. Y. Khayal, "A Comprehensive Survey of Candidate Waveforms for 5G, beyond 5G and 6G Wireless Communication Systems," *Open Journal of Applied Sciences*, vol. 13, no. 01, pp. 136–161, 2023, doi: 10.4236/ojapps.2023.131012.

[9] N. Sivapriya, M. K. Vanteru, K. K. Vaigandla, and G. Balakrishna, “Evaluation of PAPR, PSD, Spectral Efficiency, BER and SNR Performance of Multi-Carrier Modulation Schemes for 5G and Beyond,” *SSRG International Journal of Electrical and Electronics Engineering*, vol. 10, no. 11, pp. 100–114, Nov. 2023, doi: 10.14445/23488379/IJEEE-V10I11P110.

[10] B. Khan and F. J. Velez, “Multicarrier Waveform Candidates for Beyond 5G,” 2020.

[11] S. Acquah, A. Krampah-Nkoom, and M. O. Adjei, “Performance of the Candidate Modulation Wave-forms for 5G Communication Systems,” *International Journal of Scientific and Research Publications (IJSRP)*, vol. 10, no. 06, pp. 597–644, Jun. 2020, doi: 10.29322/ijsrp.10.06.2020.p10274.

[12] Y. O. Imam-Fulani *et al.*, “5G Frequency Standardization, Technologies, Channel Models, and Network Deployment: Advances, Challenges, and Future Directions,” Mar. 01, 2023, *MDPI*. doi: 10.3390/su15065173.

[13] T. Mishra, V. Upadhyaya, and G. Mathur, “Waveform optimization for future wireless communication: numerical simulation under mobile and vehicular scenarios in 5G and beyond,” *Engineering Research Express*, vol. 6, no. 3, Sep. 2024, doi: 10.1088/2631-8695/ad6bef.

[14] “Review: Waveform Design for Improve Perform Analysis of 5G,” *Advances in Image and Video Processing*, vol. 10, no. 4, Oct. 2022, doi: 10.14738/aivp.104.13000.

[15] “Modeling of Signals and Spectra: 5G and Beyond,” Portland State University, 2023. doi: 10.15760/etd.3649.

[16] A. K. M. Baki, “Comparison of different New Radio (NR) waveforms for wireless communications,” *PLoS One*, vol. 18, no. 4 April, Apr. 2023, doi: 10.1371/journal.pone.0283886.

[17] T. C. Prakash, “Multicarrier Waveforms for Advanced Wireless Communication,” *Journal Of Mechanics Of Continua And Mathematical Sciences*, vol. 15, no. 7, Jul. 2020, doi: 10.26782/jmcms.2020.07.00020.

[18] T. Kebede, Y. Wondie, J. Steinbrunn, H. B. Kassa, and K. T. Kornegay, “Multi-Carrier Waveforms and Multiple Access Strategies in Wireless Networks: Performance, Applications, and Challenges,” *IEEE Access*, vol. 10, pp. 21120–21140, 2022, doi: 10.1109/ACCESS.2022.3151360.

[19] H. Lin, J. Yuan, W. Yu, J. Wu, and L. Hanzo, “Multi-Carrier Modulation: An Evolution from Time-Frequency Domain to Delay-Doppler Domain,” Aug. 2023, [Online]. Available: http://arxiv.org/abs/2308.01802

[20] Z. Augustine, A. M. S Tekanyi, S. M. Sani, A. D. Usman, and A. S. Yaro, "Development of a Novel Feedback Filtered Orthogonal Frequency Division Multiplexing Scheme for 5G Network and Beyond."

[21] H. Chen, J. Hua, F. Li, F. Chen, and D. Wang, "Interference Analysis in the Asynchronous f-OFDM Systems," *IEEE Transactions on Communications*, vol. 67, no. 5, pp. 3580–3596, May 2019, doi: 10.1109/TCOMM.2019.2898867.

[22] Y. A. Al-Jawhar, K. N. Ramli, M. A. Taher, N. S. M. Shah, S. A. Mostafa, and B. A. Khalaf, "Improving PAPR performance of filtered OFDM for 5G communications using PTS," *ETRI Journal*, vol. 43, no. 2, pp. 209–220, Apr. 2021, doi: 10.4218/etrij.2019-0358.

[23] Javad Abdoli, Ming Jia, and Jianglei Ma, "*Filtered OFDM: A New Waveform for Future Wireless Systems"*. 2015.

[24] M. A. Hussein, A. K. Nahar, and A. H. Ali, "A new hybrid approach for reducing the high PAPR in OFDM and F-OFDM systems with low complexity," in *Proceedings - 2nd Al-Noor International Conference for Science and Technology, NICST 2020*, Institute of Electrical and Electronics Engineers Inc., Aug. 2020, pp. 57–62. doi: 10.1109/NICST50904.2020.9280313.

[25] H. T. Dumari, D. J. Gelmecha, R. K. Shakya, and R. S. Singh, "BER and PSD Improvement of FBMC with Higher Order QAM Using Hermite Filter for 5G Wireless Communication and beyond," *Journal of Electrical and Computer Engineering*, vol. 2023, 2023, doi: 10.1155/2023/7232488.

[26] S. A. Khudhair and M. J. Singh, "Review in FBMC to enhance the performance of 5G networks," *Journal of Communications*, vol. 15, no. 5, pp. 415–426, May 2020, doi: 10.12720/jcm.15.5.415-426.

[27] N. Chandra Sekhar, G. Sai GaneSH, V. Varshith, and S. Meghna, "Comparative Analysis in Terms of PAPR And PSD Considering Various Filters In FBMC.," 2020.

[28] Srikanth Kundrapu, Srilatha Indira Dutt V.B.S, Nitesh Kalyan Koilada, and Adithya Chowdary Raavi, "*Characteristic Analysis of OFDM,FBMC and UFMC Modulation Schemes for Next Generation Wireless Communication Network Systems*." [IEEE], 2019.

[29] B. Ramakrishnan, A. Kumar, S. Chakravarty, M. Masud, and M. Baz, "Analysis of FBMC waveform for 5g network based smart hospitals," *Applied Sciences (Switzerland)*, vol. 11, no. 19, Oct. 2021, doi: 10.3390/app11198895.

[30] L. Sakkas, E. Stergiou, G. Tsoumanis, and C. T. Angelis, “5G UFMC scheme performance with different numerologies,” *Electronics (Switzerland)*, vol. 10, no. 16, Aug. 2021, doi: 10.3390/electronics10161915.

[31] F. S. Shawqi, L. Audah, A. T. Hammoodi, M. M. Hamdi, and A. H. Mohammed, “A Review of PAPR Reduction Techniques for UFMC Waveform,” in *4th International Symposium on Multidisciplinary Studies and Innovative Technologies, ISMSIT 2020 - Proceedings*, Institute of Electrical and Electronics Engineers Inc., Oct. 2020. doi: 10.1109/ISMSIT50672.2020.9255246.

[32] M. I. Al-Rayif, H. E. Seleem, A. M. Ragheb, and S. A. Alshebeili, “PAPR reduction in ufmc for 5G cellular systems,” *Electronics (Switzerland)*, vol. 9, no. 9, pp. 1–15, Sep. 2020, doi: 10.3390/electronics9091404.

[33] A. Hazareena and B. A. Musthafa, “UFMC System Performance Analysis for 5G Cellular Networks,” 2021.

[34] A. Farhang, N. Marchetti, and L. E. Doyle, “Low-Complexity Modem Design for GFDM,” *IEEE Transactions on Signal Processing*, vol. 64, no. 6, pp. 1507–1518, Mar. 2016, doi: 10.1109/TSP.2015.2502546.

[35] M. Murad, I. A. Tasadduq, and P. Otero, “Towards Multicarrier Waveforms beyond OFDM: Performance Analysis of GFDM Modulation for Underwater Acoustic Channels,” *IEEE Access*, vol. 8, pp. 222782–222799, 2020, doi: 10.1109/ACCESS.2020.3043718.

[36] V. Kishore, V. M. Vakamulla, W. O. Popoola, and A. Kumar, “5th Generation of GFDM and Analysis of Ser Using Filter,” *IEEE Open Journal of the Communications Society*, vol. 1, pp. 1614–1622, 2020, doi: 10.1109/OJCOMS.2020.3030118.

[37] M. Nadzmi bin Mazlan and I. Ku, “Generalized Frequency Division Multiplexing (GFDM) Multicarrier Modulation for 5G and Beyond,” 2019.

[38] A. Hilario-Tacuri, J. Maldonado, M. Revollo, and H. Chambi, “Bit Error Rate Analysis of NOMA-OFDM in 5G Systems with Non-Linear HPA with Memory,” *IEEE Access*, vol. 9, pp. 83709–83717, 2021, doi: 10.1109/ACCESS.2021.3087536.

[39] A. A. Sahrab and A. D. Yaseen, “Filtered orthogonal frequency division multiplexing for improved 5g systems,” *Bulletin of Electrical Engineering and Informatics*, vol. 10, no. 4, pp. 2079–2087, Aug. 2021, doi: 10.11591/EEI.V10I4.3119.

[40] M. G. Sadeque, “Bit Error Rate (BER) Comparison of AWGN Channels for Different Type’s Digital Modulation Using MATLAB Simulink,” 2015, [Online]. Available: http://asrjetsjournal.org/

[41] A. Hammoodi, L. Audah, and M. A. Taher, "Green coexistence for 5g waveform candidates: A review," *IEEE Access*, vol. 7, pp. 10103–10126, 2019, doi: 10.1109/ACCESS.2019.2891312.

[42] H. Ji, C. Sun, and W. Shieh, "Spectral Efficiency Comparison Between Analog and Digital RoF for Mobile Fronthaul Transmission Link," *Journal of Lightwave Technology*, vol. 38, no. 20, pp. 5617–5623, Oct. 2020, doi: 10.1109/JLT.2020.3003123.

[43] H. Yin, J. Luo, B. Wang, B. Zhang, S. Luo, and D. Kong, "Novel Waveform Design with a Reduced Cyclic Prefix in MIMO Systems," *Electronics (Switzerland)*, vol. 13, no. 10, May 2024, doi: 10.3390/electronics13101968.

[44] P. Krishna and T. A. Kumar, "Spectral efficiency evaluation of 5G waveform candidates," *International Journal of Recent Technology and Engineering*, vol. 8, no. 2 Special Issue 8, pp. 1779–1781, Aug. 2019, doi: 10.35940/ijrte.B1152.0882S819.

[45] S. B. Makarov *et al.*, "A reduction of peak-to-average power ratio based faster-than-nyquist quadrature signals for satellite communication," *Symmetry (Basel)*, vol. 13, no. 2, pp. 1–19, Feb. 2021, doi: 10.3390/sym13020346.

[46] F. S. Shawqi *et al.*, "A new SLM-UFMC model for universal filtered multi-carrier to reduce cubic metric and peak to average power ratio in 5G technology," *Symmetry (Basel)*, vol. 12, no. 6, Jun. 2020, doi: 10.3390/SYM12060909.

[47] A. Kaľavský, A. Niesłony, and R. Huňady, "Influence of PSD Estimation Parameters on Fatigue Life Prediction in Spectral Method," *Materials*, vol. 16, no. 3, Feb. 2023, doi: 10.3390/ma16031007.

[48] T. Padmavathi, K. K. Cheepurupalli, and R. Madhu, "Analysis of Multi Carrier Modulation Techniques for 5G Physical Layer Communications Estimation of KPI," *J Sci Ind Res (India)*, vol. 81, no. 11, pp. 1224–1232, 2022, doi: 10.56042/jsir.v81i11.42701.

[49] B. Zhang, Y. Qu, and M. Chen, "Simulation and Performance Study of Quadrature Amplitude Modulation and Demodulation System," in *IOP Conference Series: Materials Science and Engineering*, Institute of Physics Publishing, Apr. 2020. doi: 10.1088/1757-899X/782/4/042048.

[50] M. Alhalabi and N. Taşpınar, "Comparison between high orders Phase Shift Keying (PSK) and Quadrature Amplitude Modulation (QAM) for Coherent Detection Optical Frequency Division Multiplexing System (CO-OFDM) Key Word: Orthogonal Frequency Division Multiplexing (OFDM), Phase Shift Keying (PSK), Quadrature Amplitude Modulation (QAM),

CoherentDetection OFDM (CO-OFDM)," vol. 15, no. 5, pp. 1–08, 2020, doi: 10.9790/1676-1505010108.

[51] D. Bala, M. N. Islam, I. Abdullah, M. A. Hossain, and M. S. Alam, "Analysis the Performance of OFDM Using BPSK, QPSK, 64-QAM, 128-QAM & 256-QAM Modulation Techniques," 2021.

[52] Q. Ma, J. Lu, and Y. Maoxiang, "Integrated Waveform Design for 64QAM-LFM Radar Communication," in *IEEE Advanced Information Technology, Electronic and Automation Control Conference (IAEAC)*, 2021, pp. 1615–1625. doi: 10.1109/IAEAC50856.2021.9390784.

[53] M. Varasteh, B. Rassouli, and B. Clerckx, "On Capacity-Achieving Distributions for Complex AWGN Channels under Nonlinear Power Constraints and Their Applications to SWIPT," *IEEE Trans Inf Theory*, vol. 66, no. 10, pp. 6488–6508, Oct. 2020, doi: 10.1109/TIT.2020.2998464.

[54] X. Yu, S. Wei, and Y. Luo, "Finite Blocklength Analysis of Gaussian Random Coding in AWGN Channels under Covert Constraint," *IEEE Transactions on Information Forensics and Security*, vol. 16, pp. 1261–1274, 2021, doi: 10.1109/TIFS.2020.3032292.

[55] Ziwei Xuan and Krishna Narayanan, "*Analog Joint Source-Channel Coding for Gaussian Sources over AWGN Channels with Deep Learning"*. IEEE, 2020.

[56] A. Halder, Mst. N. Akter, J. Roy, Md. R. Tanshen, and M. A. Hossain, "A MATLAB Simulink Study on the Performance of QAM Modulation Scheme in AWGN, Rayleigh, and Rician Fading Channels: BER Analysis," *Irish Interdisciplinary Journal of Science & Research*, vol. 07, no. 02, pp. 34–41, 2023, doi: 10.46759/iijsr.2023.7205.

[57] G. M. Waliullah, D. Bala, A. Hena, M. Ibrahim Abdullah, and M. Alamgir Hossain, "Study the BER Performance Comparison of MIMO Systems Using BPSK Modulation with ZF and MMSE Equalization," 2020, doi: 10.34104/ajeit.020.077084.

[58] H. Chen, R. Zhou, Q. Yuan, Z. Guo, and W. Fu, "KAN-ResNet-Enhanced Radio Frequency Fingerprint Identification with Zero-Forcing Equalization," *Sensors*, vol. 25, no. 7, Apr. 2025, doi: 10.3390/s25072222.

[59] S. R. Mithun, C. K. R, P. Nagaraju, and P. Nagaraju Associate professor, "BER REDUCTION USING VARIOUS INTERFERENCE CANCELLATION DETECTOR IN MIMO SYSTEMS," *International Journal of Engineering Technology Research & Management IJETRM*, 2020, [Online]. Available: http://ijetrm.com/

[60] Z. Wang, X. Chen, C. Liu, X. Ning, and Z. Sun, "BER performance analysis of hybrid carrier framework with IQ imbalance compensation," in *IEEE Wireless Communications and Networking Conference, WCNC*, Institute of Electrical and Electronics Engineers Inc., 2021. doi: 10.1109/WCNC49053.2021.9417263.