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Spectral Efficiency Improvement in 5G Systems by Polyphase Decomposition

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Abstract : This article proposes a filter bank format combined with the mathematical tool called polyphase decomposition and the discrete Fourier transform (DFT) with the purpose of improving the performance of the fifth-generation communication systems (5G). We started with a review of the literature and the study of the filter bank theory and its combination with DFT in order to improve the performance of wireless communications since it reduces the computational complexity of these communication systems. With the proposed technique, several experiments were carried out in order to evaluate the structures in 5G systems. Finally, the results are presented in graphical form in terms of bit error rate against the ratio bit energy/noise power spectral density (BER vs. Eb / No).

Keywords : multi-carrier system (5G), filter bank, polyphase decomposition, FIR equalizer
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