

# **Abstract**

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## **Investigation of the Performance of the Wavelet Packet Based Multi-Carrier CDMA Communications in Rayleigh Fading Channel**

In this paper, an investigation of the performance of the wavelet transform and wavelet packet based multicarrier CDMA communications in Rayleigh fading channel is presented for different wavelet families. Replacing the Fourier based complex exponential carriers of MC-CDMA with orthonormal wavelets packets in the application of discrete wavelet packet transform (DWPT) based MC-CDMA is an efficient method to avoid adding the guard band cyclic prefix and to improve the performance of the system. The bit error rate performance of the wavelet transform and wavelet packet based multi-carrier CDMA Communications in Rayleigh fading channel and additive white Gaussian noise (AWGN) Channels are compared with each other. Also, the results are compared with the performance of FFT based MC-CDMA in Rayleigh fading channel. Wavelet packet multicarrier modulation performs well for the fading channel than conventional MC-CDMA.