

Performance Analysis of a Combined Ordered Successive and Interference Cancellation Using Zero-Forcing Detection over Rayleigh Fading Channels in Mimo Systems

Authors : Jamal R. Elbergali

Abstract : Multiple Input Multiple Output (MIMO) systems are wireless systems with multiple antenna elements at both ends of the link. Wireless communication systems demand high data rate and spectral efficiency with increased reliability. MIMO systems have been popular techniques to achieve these goals because increased data rate is possible through spatial multiplexing scheme and diversity. Spatial Multiplexing (SM) is used to achieve higher possible throughput than diversity. In this paper, we propose a Zero-Forcing (ZF) detection using a combination of Ordered Successive Interference Cancellation (OSIC) and Zero Forcing using Interference Cancellation (ZF-IC). The proposed method used an OSIC based on Signal to Noise Ratio (SNR) ordering to get the estimation of last symbol ($\tilde{x}_{(N_T)}$), then the estimated last symbol is considered to be an input to the ZF-IC. We analyze the Bit Error Rate (BER) performance of the proposed MIMO system over Rayleigh Fading Channel, using Binary Phase Shift Keying (BPSK) modulation scheme. The results show better performance than the previous methods.

Keywords : SNR, BER, BPSK, MIMO, modulation, zero forcing (ZF), OSIC, ZF-IC, spatial multiplexing (SM)

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