

PERFORMANCE OF MAXIMAL RATIO COMBINER OVER RAYLEIGH FADING CHANNELS FOR SLOW AND FREQUENCY SELECTIVE FADING CHANNELS

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Abstract

Using wireless communication it is possible to have seamless connection. At present the most widely used application of wireless communication is of voice telephony, where users can transmit and receive speech without being stuck to a particular location. Channel time-variation (or fading) is the major source of impairment in digital wireless communications. Diversity is an effective method for combating fading by increasing SNR without increasing transmitter power. Fading deteriorates the communication link. The performance of a diversity system depends on combining scheme used, correlation between the branches and power imbalance. Maximal ratio combining scheme is an efficient combining scheme for the diversity system used.. The working of such a diversity system is analyzed over Rayleigh fading channels, which are slow and frequency selective. The joint probability density function of the received envelopes r_1 and r_2 in a correlated and unbalanced Rayleigh fading channel is found. It is observed that as correlation increases, the performance degrades.

Keywords: MRC (Maximal ratio combining), Rayleigh Fading, PDF (Probability density function)
Diversity, SNR (Signal to noise ratio)