ABSTRACT

Wireless communication media is generally used but has certain impairments. One of those which mostly happened within urban area or city area are multipath fading. Effect from multipath fading could degrade the performance of wireless communication system. There are several research had been done to reduce the effect of multipath fading and one of them is by using diversity technique.

MIMO STBC Alamouti is a diversity transmission technique which is quite simple compared to others. In this final project, a communication system is made using a MIMO technique, consist of transmitter with Alamouti coding and receiver with MRC technique while using BPSK modulation. This system was implemented using a hardware DSP Starter Kit TMS320C6416T and was tested against flat, slow rayleigh fading and AWGN channel.

Analysis is consisting of BER value from experiment result which acquired by variating Eb/N0 parameter on AWGN channel. Experiment results of simulation and implementation are shown on BER v.s. Eb/N0 graph by sending 100,000 bits. Results of implementation on DSK TMS320C6416T shows that MIMO Alamouti system has superior BER value in contrast to MISO and SISO, With BER $3 \times 10^{-3}$ MIMO can reach value Eb/N0 13 dB better than SISO and 6 dB better than MISO. From previously mentioned result, the conclusion is that MIMO Alamouti has better performance against fading.

**Keywords**: MIMO STBC Alamouti, MRC, Rayleigh fading, DSK TMS320C6416T
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