ABSTRACT

Long Term Evolution (LTE) is a technology that can accommodate high-speed communications with a wide bandwidth. However, communications with high speed broadband vulnerable to degradation due to selective fading. It is very harmful because it can lead to inter-symbol interference, which can increase the bit error rate (BER). In addition, the high mobility also causes fast fading where the power fluctuates very quickly.

To overcome this, this reseacrh use space frequency block coding (SFBC) and coding rotated MIMO modulation (CRM) to improve signal quality. The SFBC relies on algorithm that applies the principles Alamouti space-frequency diversity. Coding rotated modulation (CRM) is implemented by rotating the signal constellation and using quadrature interleaver. Both techniques are implemented in the LTE downlink systems with Rayleigh channels models and different user velocity from 60 km / h to 150 km / h. Performance parameters is shown by comparison Eb / No and Bit Error Rate (BER).

The results of the simulation shows that system that implements CRM can improve the performance of the system. Systems that implement CRM reached 10^{-4} BER with Eb / No of 8.3 dB at 60 km/h. To achieve the same BER at 120 km / h takes Eb / No of 8.8 dB and 9.1 dB at 150km/jam. System without CRM systems achieve 10^{-4} BER with Eb / No of 10.3 dB for 60km/jam, 10.7 dB for of 120 km / h and 11.24 for 150 km / h. The optimum angel rotation for CRM is at 0,46364.

Keyword : *LTE, SFBC, CRM*