

## ABSTRACT

The needs of high speed data transmission and a very high user mobility are increasing. At a very high mobility, the channel would deteriorate so the quality of signal receive will decrease rapidly. To handle high-speed data transmission, the use of OFDM system can be applied. However, OFDM can not fix the quick deteriorating channel.

This thesis proposes the use of rotated Coding Modulation (CRM) in OFDM systems that are expected to provide optimum results. Rotated Coding Modulation (CRM) can be applied by rotating the signal constellation and the use of quadrature interleaver with subcarrier interleaver. Influence CRM implementation will be investigated by means simulated through a Rayleigh channel with AWGN noise.

The results showed that at a speed of 120 km / h with an optimal number of subcarriers 1024, OFDM system with CRM-QPSK modulation only required power 10.87 dB to achieved BER  $10^{-4}$ , while the OFDM system with a conventional modulation required power until 12.56 dB. Compared with OFDM systems that used conventional 16-QAM modulation, the 16-QAM modulation with Rotated Coding Modulation (CRM) could provide improvement up to 1.4 dB to achieve same BER.