

ABSTRACT

A combination between MIMO and OFDM expected to become a solution to increase data rate in wireless communication. Wireless communication is rich of scattering that can make the signal face multipath fading, where the signal actually faces frequency selective fading response. With OFDM technique frequency selective fading channel will become flat fading in every subcarrier. And with MIMO technique performance caused multipath fading effect will be handled.

To implement MIMO OFDM technique needed changing in baseband signal processing, such as channel estimation, synchronization tracking and MIMO detection. In this final research will talk how to design and simulate MIMO OFDM in wireless LAN based 802.11a, where use 2 antenna transmit and 2 antenna receive, also use 16QAM modulation and 64QAM modulation.

The result shown that 16QAM performance need E_b/N_0 more less than 64QAM, for example to reach BER 10^{-5} power raise ± 12 dB. MIMO OFDM system with frequency selective rayleigh fading condition has better performance than SISO OFDM, gain ± 8 dB. In MIMO OFDM system 64QAM with CR $\frac{3}{4}$ is the best throughput than other system. And using MIMO(2,2) system also can increase channel capacity twice compared SISO.