

ABSTRACT

OFDM enable system to achieve higher spectral efficiency because of the orthogonality of its carrier frequency. Orthogonality make the system possible to avoid interference between sub-carrier so that the multipath channel effect will reduced. Power loading makes the better performance of OFDM system by allocating bit and power to its sub-carrier based on channel condition feedback. On the other hand, there is emerging opinion saying that power loading will bring consequences to Peak to Average Power Ratio (PAPR) system because the fact shows that OFDM systems will always suffer from large PAPR problem in all way to improve OFDM performance.

This final project analyzed the impact of power loading on improving OFDM performance and the effect of this improvement to PAPR. Different type of modulation such as QPSK, 16-QAM and 64-QAM and different modulation scheme such as fixed and adaptive are applied in analyzing process. The analysis observes the impact of user movement indicated by Doppler frequency to OFDM performance and the impact of various number of sub-carrier to PAPR system.

Simulation result shows that power loading able to improve OFDM performance by giving coding gain to system in the amount of 3.5 dB on 16-QAM modulation, and about 5.5 dB on 64-QAM modulation. If higher order modulation applied, bigger coding gain is given to system in order to maintain the better performance of OFDM. Power loading will not cause higher PAPR, otherwise it will reduce PAPR since the allocating process of bit and power will avoid peak signal that will exceed amplifier linear region.

Keyword: OFDM, *Power Loading*, BER, PAPR