

ABSTRACT

Orthogonal Division Multiplexing (OFDM) is a multicarrier communication scheme which divides bandwidth of channel into several subcarriers, data symbol is modulated and transmitted in each subcarriers. OFDM effectively used in handling a distortion caused by multipath effects. It can also handle Intersymbol Interference (ISI) by inserting wider guard time than the channel delay spread. An adaptive array antenna is implemented to improve OFDM performances in handling an interferences. Implementation of adaptive array antenna using several number of antenna elements help separating the desired signal from interferences.

This final project research the differences between pre-FFT and post-FFT adaptive array antenna methods in increasing system performances. Theoretically, the differences between the two methods is located on the way each methods apply the weighting factors, while pre-FFT done before FFT, post-FFT done it after FFT. Both methods that was examined not held up to smart antenna technique, just examining the use of weighting factor with adaptive algorithm because the system just for single user. The LMS (Least Mean Square) algorithm is an adaptive algorithm used here.

Based on the experiment result, post-FFT methods give a better performance than pre-FFT. When systems using 8 antenna elements in AWGN, BER = 10^{-4} in pre-FFT could be reach at SNR \pm 19 dB while post-FFT could reach it at SNR \pm 8.5 dB. In other way, post-FFT need more time to reach convergence than pre-FFT because post-FFT needs to generate weighting factor as many as subcarriers number of FFT output. More elements antenna used in the both methods give better performance to the systems.

Keywords : OFDM, *Adaptive Array Antenna*, *Pre-FFT*, *Post-FFT*, *LMS algorithm*