

ABSTRACT

The current wireless cellular base station antenna system employs switched beam technology which suffers from its inefficiency to track the user and limited capacity. Smart antenna is an antenna array system where there is a received signal processing system using the appropriate algorithm to improve system performance. Smart antenna can optimize the transmit pattern according to the environmental response.

My research will analyze the performance of smart antenna using Least Squares Constant Modulus Algorithm (LS-CMA). In previous research used Recursive Least Square (RLS) dan Least Mean Square (LMS) algorithm to minimize the number of quadrature error estimation in weighting to each element antenna. This simulation will analyze mean square error (MSE) with signal to noise ratio (SNR) using test parameters such as the number of the interferences, the number of elements antenna, the number of subcarriers, and velocity of the user. Furthermore, this research is to analyze the quality of signal with observe the cost of SNIR in the changing of velocity of the user and the number of interferences.

The result of my research is Mean square error value results LS-CMA algorithm converge from iterations 3, faster than RLS algorithm which converge from iterations 15 and LMS algorithm which converge from iterations 40. The reduction cost of MSE is caused by the decreasing of interferences signal, increase the number of elements antenna, and decreasing the number of subcarriers. Furthermore, the increase of the amount of interference and velocity of the user did not cause an significant increase in the mean square error, even tend to stable. This shows that the smart antenna with adaptive radiation pattern can minimize the interference arrival direction and smart antenna system could provide a good beam for movement to the user so that up to speed 120 km / h, user still get optimal signal from the BTS. SNIR values will become smaller with increasing number of interference and the faster speed of user.

Keywords : beam, smart antenna, LS-CMA, mobile WiMAX