

ABSTRACT

Code Division Multiple Access (CDMA) and smart antenna are some efficient way to increase spectrum frequency efficiently. In other hand, CDMA system depends on interference between users. This problem used to be solved by interference cancellation, multi-user detection, beamforming, and power control. Commonly, these techniques used separately. But this final assessment tries to combine beamforming and power control to increase the system's performance.

Beamforming will increase the system capacity with maximizing gain to desired direction, and at the same time placing minimal radiation pattern in the direction of the interferers. Beamforming is performed by using smart antenna system at base station, so the transmission has a downlink direction.

Power control has a main objective where the user's signal (inside one cell) has to obtain a relatively same receive power level that felt by base station. Power control is used to anticipate near-far problem which is caused by the different range between users in one cell. This different range also makes some quality factor differences at base station. This transmission has an uplink direction.

This final assessment is purposed to apply a beamforming algorithm for updating user's power transmit. This updating has an objective to make user's power transmit as minimum as possible but the power receives quality still in a very good condition. This observation will show the ability of Least-squares Despread-Respread Multitarget Constant Modulus Algorithm (LSDRMTCMA) to maximize the main-beam and minimize the attenuation to the interferer. The performance will be measured in SNIR related to amount of user, processing gain, sampling rate, and number of array element in the Rayleigh environment.

The final result shows that the circular array gives better performance than linier array. The system performance also increases along with the amount of array element and processing gain.

Key words: Smart antenna, CDMA, Beamforming, Power control, dan LSDRMTCMA.