ABSTRACT

3G is one of the emerging telecommunication technology in Indonesia. It offers voice, data and video transfer services in realtime to the user. Wideband-CDMA system is used to meet the needs of bandwidth and can provide up to 2 Mbps datarate. WCDMA is a direct spread technology, which means it will spread the transmission over a 5MHz bandwidth.

CDMA (Code Division Multiple Access) Technology has advantages over other multiple access technologies such as TDMA and FDMA. But in this system, the phenomenon of multipath fading has become a fundamental problem. Signal will experience a performance degradation due to multipath fading effects. Multiple Input Multiple Output Technique is used to overcome the effects of multipath fading. It can overcome deep fades using the signal replica which has a stronger power, the system can operate at low transmit power, and also makes the system more stable.

This final task analize Multiple Input Multiple Output (MIMO) transmission techniques. This final task will show the Wideband-CDMA system performance in uplink using the STBC (Space Time Block Coding) scheme. Decorrelator technique will be used to detect multiuser. The system modeled on the mobile propagation channel with AWGN Rayleigh with 2 x 2 antenna schema.

The analysis result shows that MIMO techniques can improve WCDMA system performance. The improvement obtained is approximately 4 dB at a speed of 30 km/h with 4 users. However, the improvement will change with the increasing number of user and speed. The decorrelator as a technique that provides multiuser detection also gives an improvement in the system performance. At the speed of 30 km/h with 2 active users, decorrelator provides approximately 8 dB improvement. So the conclusion is, the result is better with the MIMO technique at the transmitter and the decorrelator at receiver.

Key Words: MIMO, WCDMA, *decorrelator*