ABSTRACT

The rapid development of wireless networks in this time requires standards that govern them. One of telecommunication standards used is 3GPP LTE (The Third Generation Partnership Project Long Term Evolution), which is a collaboration association originating from several countries. By that standard the development of wireless networks with high data rates in the future is an important issue. One of technique that supports the network for example LTE network is a MIMO system.

The basic idea of the MIMO system is used for distributing multiple antennas at one or both ends of the communication link that needs to use the proper detection algorithm on the receiving end and exploit multipath scattering which is a common phenomenon in wireless channels. Sphere detection which can be one solution for detection in MIMO antenna which has a lot of high order modulation. In this project was designed and simulated Sphere Detector with 2x2 antenna system the modulation used is 16 QAM and 64 QAM, as well as the number number of bits as much 1280-1920000 bit.

The simulation results show that the Sphere Detector has performance similar to other detection systems, such as the Maximum Likelihood Detector. For example with BER 10^{-1}, the SNR will be the same value for the SD and for the ML are 9 dB for 16 QAM modulation and 14.94 dB for 64 QAM modulation. As for the data processing time, Sphere Detector tends to be better than the maximum likelihood detector on higher order modulation.

Keywords: LTE, MIMO, S*phere Detector*.