

ABSTRACT

The development of telecommunications technology are now starting towards a BWA (Broadband Wireless Access) technology. WiMAX (Worldwide Interoperability for Microwave Access) is a technology that was developed because of increased demand for broadband wireless access (BWA). WiMAX is a BWA standard that was introduced by the IEEE (Institute of Electrical and Electronic Engineering) with IEEE 802.16 system. WiMAX technology based on OFDM (Orthogonal Frequency Division Multiplexing). OFDM is a transmission technique that uses the several frequencies which are mutually orthogonal. Rate and capacity are required in the process of data transmission. To fill these demands, OFDM be an option because of its advantages.

WiMAX technology use a variety of ways to overcome the various problems caused by multipath fading conditions, one of them is the technique of error correction channel coding techniques. The addition of Forward Error Correction (FEC) is expected to reduce the quantity of bit error rate (BER) as an impact of a large data transfer fast. One of Forward Error Control type is Turbo Code.. The advantages of turbo code is a minimum power usage at each modulation so possible to send of the very low power level signal.

Based on the overall simulation results, we can conclude that using Turbo code with variation of code rate, mapping, interleaver and constraint length can get a BER increasing too. To get a quality BER as a big 10^{-4} , on code rate 1/3 needed SNR 5.75 dB with a coding gain as a big 5.75 dB. Mapper using a QPSK signal mapping get a better performance than 16 QAM because it can reach a BER target 10^{-5} in SNR as a big 6.5 dB with coding gain as a big 3 dB and the use of the Random interleaver shows excellent performance in terms of improving the BER. When system using a Random Interleaver 16x16, BER target BER 10^{-4} can be reached at SNR 5 dB with coding gain as a big 2.5 dB.