

## ABSTRACT

The focus of the wireless communication system today is providing services with data rate is high even for multimedia services and Internet access. One way that can be done to encourage it is to use multicarrier modulation technique. OFDM (Orthogonal Frequency Division Multiplexing) system is a scheme where the multicarrier communication between mutually orthogonal frequency subcarriers and overlapping each other.

Because of these advantages, OFDM systems are used as the modulation technique and multiple access, better known as OFDMA (Orthogonal Frequency Division Multiple Access), the WiMAX technology (Worldwide Interoperability for Microwave Access), Wimax multiuser system performance is strongly influenced by the effects of one Multiple Access Interference (MAI). In the uplink system Orthogonal Frequency Division Multiple Access (OFDMA), Multiple Access Interference (MAI) occurs because of differences Carrier Frequency Offsets (CFO) of different users at the receiver (receiver). One way to improve performance multiuser systems related Wimax MAI effect is to use the technique of multiuser detection (MUD). There are several types of multiuser detection (MUD), such as successive Interference Cancellation (SIC), Parallel Interference Cancellation (PIC), Decorrelator, MMSE, and more.

In this final assignment system performance will be analyzed by using the method of Parallel Interference Cancellation (PIC). Simulations show the performance improvement system. This is demonstrated by the improvement of SNR by 6 dB to achieve BER of  $10^{-3}$  on the condition of the user 4, user speed of 3 km / h and the number of PIC stages are used compared with 2 stage without using the PIC. Any system performance declines with the increase speed of the user. The increase in SNR values shown by the method of Parallel Interference Cancellation (PIC) compared with the performance without using the PIC.

***Index Term: OFDM, OFDMA, WiMAX, PIC, MUD***

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*Analisa Parallel Interference Cancellation (PIC) Sebagai Teknik Penanganan Multiple Access Interference (MAI) Pada WiMAX*