

## **ABSTRACT**

MIMO-OFDM technology can increase both system's capacity and spectral efficiency significantly. MIMO-OFDM also decrease the effects of fading due to diversity technique <sup>[11]</sup>. However, by using multiple antenna method also have problems such as interference caused by transmission between antenna.

To overcome the interference, we need a process that can detect the signal so that the effects of such interference can be minimized. In this study will be used signal detection method of non-linear in MIMO, successive interference cancellation (SIC), which will be used by the receiver to improve the quality of the received signal. SIC has a lower computational complexity compared to other detection method <sup>[7]</sup>. In MIMO-OFDM system, signal transmitted using multiple antennas so that the signal received by the antenna signal  $RX_i$  is a group of transmitted signal from the antenna TX. The received signal is detected and the SIC will take the signal was first received. The signal will be processed so get desired signal and eliminate or reduce interference. The residue of the signal processing is used to improve the signal to be processed next. By using the SIC, the quality of the received signal will increase.

SIC improve the performance seen from the declining value of the BER. In the MISO-OFDM systems, conditions of the user with a speed of 100km/h has improved by SIC by 6dB at BER  $10^{-5}$ . On the condition of the user with the speed of 120km/h improvement of 3dB at BER  $10^{-4}$ . And improvement of 3,5dB to achieve BER of  $10^{-3}$  at a speed of 150km/h. For MIMO-OFDM systems, improvement of 0,5dB to reach BER  $10^{-6}$  on the user with a speed of 50km/h. Improvement of 1dB to reach BER  $10^{-6}$  with user conditions moving 100km/h. When user moves with the speed of 120km/h, the improvement in the BER  $10^{-6}$  for 3,3dB. While the user with a speed of 150km/h, the improvement in achieving BER  $10^{-6}$  for 4,2dB.

**Keywords:** MIMO-OFDM, SIC, BER, OFDM, STBC