ABSTRACT

In a V2V communication system, the user on the transmitter and receiver side moves randomly and surrounded by a scatterer that also moves randomly. One of the problems that appear when the transmitter and receiver move is the Doppler effect. One of the promising multi carriers is Generalized Frequency Division Multiplexing (GFDM). GFDM system that is already widely known that modulation using Quadrature Amplitude Modulation (QAM). The application of QAM modulation is good enough to increase spectral efficiency, but on the other hand QAM has weaknesses, namely high implementation complexity and there is still Intercarrier Interference (ICI). In this research integrates the V2V channel with a moving scatterer with GFDM-OQAM multi carrier and validation proses by compares the results of the simulation BER values with the theoretical BER values. Zero forcing equalization technique is used to mitigate the Doppler effect that occurs. The output of the simulation results is a BER value. From the simulation results, Zero Forcing equalization can mitigate the Doppler effect on the V2V channel. When the value of Eb/No is 0 dB at a speed of 17 m/s, the BER value of ZF is 1.734×10^{-1} and without ZF the BER value is 1.909×10^{-1}. At a speed of 22 m/s the BER value of ZF is 1.806×10^{-1} and without ZF the value of BER is 1.954×10^{-1}. At a speed of 30 m/s the BER value of ZF is 1.879×10^{-1} and without ZF the value of BER is 2.006×10^{-1}. BER value using ZF equalization is better than without ZF equalization.

***Keywords:** GFDM, V2V Channel, Doppler Effect, BER, Zero Forcing*