

ABSTRACT

The Free Space Optical-Link (FSO) communication system is a wireless optical communication system that uses free space as its transmission medium, has the ability to provide high data-rates, lack of interference, easy maintenance, and costs less than cable-optic communication systems. Weather conditions such as rain do not really interfere with the performance of the FSO system, but weather conditions such as fog are one of the main challenges. The parameter used in this study is Visibility and calculating the attenuation value using the Kim channel model. This final project conducts research on the performance of 16-QAM Orthogonal Frequency Division Multiplexing (OFDM) on fog attenuation in FSO systems with Transmitter to Receiver distances which will be varied as far as 0.5 km to 2 km with a range of 0.5 km and a power variation of 0 to 20 dBm using a wavelength of 1550 nm. The fog attenuation conditions used are Clear Air, Moderate Fog, and Thick Fog. The parameters used as a benchmark for system performance are Bit Error Rate (BER), System Error Rate (SER), and Error Vector Magnitude (EVM). Data collection was carried out in a simulation using Optisystem 20 Software. The results showed that increasing power would improve system quality, while distance would reduce system quality. This is indicated by the BER, SER, and EVM values. Where the smallest BER value is obtained at a power of 20 dBm and a distance of 0.5 km. This concept also applies to the SER and EVM parameters.

Keywords: Free Space Optic, OFDM, 16-QAM, Fog Attenuation.