World Academy of Science, Engineering and Technology
International Journal of Electronics and Communication Engineering
Vol:11, No:06, 2017

Impact of Different Modulation Techniques on the Performance of Free-Space Optics

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Abstract : As the demand for providing high bit rate and high bandwidth is increasing at a rapid rate so there is a need to see in this problem and finds a technology that provides high bit rate and also high bandwidth. One possible solution is by use of optical fiber. Optical fiber technology provides high bandwidth in THz. But the disadvantage of optical fiber is of high cost and not used everywhere because it is not possible to reach all the locations on the earth. Also high maintenance required for usage of optical fiber. It puts a lot of cost. Another technology which is almost similar to optical fiber is Free Space Optics (FSO) technology. FSO is the line of sight technology where modulated optical beam whether infrared or visible is used to transfer information from one point to another through the atmosphere which works as a channel. This paper concentrates on analyzing the performance of FSO in terms of bit error rate (BER) and quality factor (Q) using different modulation techniques like non return to zero on off keying (NRZ-OOK), differential phase shift keying (DPSK) and differential quadrature phase shift keying (DQPSK) using OptiSystem software. The findings of this paper show that FSO system based on DQPSK modulation technique performs better.

Keywords : attenuation, bit rate, free space optics, link length
Conference Title : ICCNMC 2017 : International Conference on Communications, Networking and Mobile Computing
Conference Location : Toronto, Canada
Conference Dates : June 15-16, 2017