

Evaluation of optical code division multiple access (OCDMA) encoding techniques for free space optics (FSO)

ABSTRACT

Free space optics (FSO) was found to have numerous applications in next generation networks, whilst optical code division multiple access (OCDMA) can be used to provide many facilities and its implementation in FSO environment has attracted several researchers. The aim of this paper is to express the achievements of these studies comprising proposed techniques in mitigating the effect of turbulence on the system. Also some defects of the mentioned studies are discussed, and suggestions for potential future researches will be provided. Furthermore, spectral amplitude coding (SAC) is implemented in FSO utilizing two different sources: light-emitting diode (LED) and laser array and their performances is compared *via* simulation. It is shown that considering bit error rate (BER) being equal to 10^{-3} as a threshold, in strong turbulence the maximum achieved distance with LED is 800 m. In the same situation using laser array can improve the distance up to 1600 m.

Keyword: Review paper; Free space optics (FSO); Optical code division multiple access (OCDMA); Light-emitting diode (LED); Laser array; Encoding; Wireless optical