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

Design and Simulation of an Inter-Satellite Optical Wireless Communication System Using Diversity Techniques

Authors : Sridhar Rapuru, D. Mallikarjunreddy, Rajanarendra Sai

Abstract : In this reign of the internet, the access of any multimedia file to the users at any time with a superior quality is needed. To achieve this goal, it is very important to have a good network without any interruptions between the satellites along with various earth stations. For that purpose, a high speed inter-satellite optical wireless communication system (IsOWC) is designed with space and polarization diversity techniques. IsOWC offers a high bandwidth, small size, less power requirement and affordable when compared with the present microwave satellite systems. To improve the efficiency and to reduce the propagation delay, inter-satellite link is established between the satellites. High accurate tracking systems are required to establish the reliable connection between the satellites as they have their own orbits. The only disadvantage of this IsOWC system is laser beam width is narrower than the RF because of this highly accurate tracking system to meet this requirement. The satellite uses the 'ephemerides data' for rough pointing and tracking system for fine pointing to the other satellite. In this proposed IsOWC system, laser light is used as a wireless connectedness between the source and destination and free space acts as the channel to carry the message. The proposed system will be designed, simulated and analyzed for 6000km with an improvement of data rate over previously existing systems. The performance parameters of the system are Q-factor, eye opening, bit error rate, etc., The proposed system for Inter-satellite Optical Wireless Communication System Design Using Diversity Techniques finds huge scope of applications in future generation communication purposes.

Keywords : inter-satellite optical wireless system, space and polarization diversity techniques, line of sight, bit error rate, Q-factor
Conference Title : ICMOC 2017 : International Conference on MicroOptics and Communications
Conference Location : Dubai, United Arab Emirates
Conference Dates : November 24-25, 2017