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OPTIMAL SATELLITE CONSTELLATION NETWORK FOR INTER-SATELLITE OPTICAL
WIRELESS COMMUNICATION**Abstract**

The next generation communication system calls for improved global coverage and higher bit-rate communication. Present-day long distance communication systems include underground optical fibre cables and ground-satellite-ground wireless RF links. An interesting alternative to the existing technology is satellite-satellite communication. The lower attenuation rates in space makes this technique more desirable to have maximum area of coverage.

Inter-satellite networks provide remote monitoring, faster speeds and diminished latency. RF based links fall short in transmitting more data due to low frequency. They have low bandwidths and low transmission range hence requiring large number of satellites for inter satellite communication. Inter-Satellite Optical Wireless Communication (IsOWC) proposed for communication between two satellites has better modulation bandwidth, high data rates, minimal signal attenuation and reduced antenna size parameters.

This paper proposes an optimal satellite network system with orthogonal frequency division multiplexing (OFDM) technique using Quadrature Amplitude Modulation. The optimal linking distance, orbit distance and number of satellites for maximum efficiency is studied. The system is simulated and analyzed in terms of Q-factor, signal-to-noise ratio, total received power and bit-error rate. The optimal system for Inter-satellite Optical Wireless Communication is modelled using OptiSystem and MATLAB and is presented in this paper.