

## **DESIGN AND PERFORMANCE ANALYSIS OF 2.5GBPS OCDMA SYSTEM BY USING NEWLY CONSTRUCTED MPSC CODE SET FOR METEROPOLITAN AREA NETWORK**

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### **Abstract**

In this paper, a simulated model of incoherent OCDMA system at 2.5Gbps bit rate is designed using a newly developed time delay based encoding system in third window *i.e.* 1550nm of optical communication system. This research is an attempt to reduce the bit error rate and multiple access interference and to increase the number of simultaneous users by designing multiwavelength Modified Prime Sequence Code (MPSC) family for OCDMA system. This simulated model is specially designed after considering all the major impairments like MAI, transmitter, receiver and channel noise etc. The results evaluated based on bit error rate, quality factor and eye diagrams show significant improvement over the previous researches. This research claims to support 19 simultaneous users at 2.5Gbps bit rate with bit error rate of  $10^{-9}$  at -15db received power.

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**Keywords:** OCDMA (Optical Code Division Multiple Access), BER (Bit Error Rate), MAI (Multiple Access Interference), 1D (One Dimensional), 2D (Two Dimensional), MPSC (Modified Prime Sequence Codes)