

Analysis of Coupling Coefficient and Crosstalk in a Homogenous Multicore Optical Fiber

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Abstract—Analysis is presented for an optical communication channel using seven core homogeneous Multicore Optical Fiber (MCF) considering the effect of coupling among the cores. The crosstalk due to inter-core coupling affects the performance of the channel in terms of Bit Error Rate (BER). Analysis is further extended to find the output of the MCF with given signal power taking into consideration the crosstalk with varying core to core distance (pitch), core radius and relative refractive index contrast at a given data rate in terms of Signal to Cross Talk plus Noise Ratio (SCNR). The outcome of this research work will be useful to design and implement optical communication systems using MCFs to enhance transmission channel capacity.

Index Terms—Multicore Optical Fiber (MCF), Crosstalk, Bit Error Rate (BER), Coupling Coefficient, Signal to Crosstalk plus Noise Ratio (SCNR)



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