Abstract

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Performance Evaluation of a Optical Logic Gates Using FWM

In this study, we introduce a design of all-optical module for half-adder/half-subtracter and 2-to-4 decoder that generates simultaneously five of all-optical logic gates at 10 Gbps. These logic gates use dispersion compensation fiber (DCF) based on four-wave mixing (FWM). This design is integrated and economic. The various outputs can be manipulated by controlling nonlinear polarization rotation (NPR) which achieves low power requirements. The high performance confirms the effectiveness of all presented functionalities at optimized input data signals of 0.01 mW at 10-12 BER with an extinction ratio (ER) greater than 20 dB.