Abstract

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Impact of Signal Wavelength on the Semiconductor Optical Amplifier Gain Uniformity for High Speed Optical Routers Employing the Segment Model

This paper investigates the impact of a train of input Gaussian pulses wavelength on semiconductor optical amplifier (SOA) gain uniformity for high speed applications. In high speed applications, the linear output gain of the input pulses is necessary in order to minimize the gain standard deviation and power penalties. A segmentation model of the SOA is demonstrated to utilize the complete rate equations. The SOA gain profile when injected with a burst of input signal is presented. A direct temporal analysis of the effect of the burst wavelength on the SOA gain and the output gain standard deviation is investigated. The output gain uniformity dependence on the input burst power and wavelength within the C-band spectrum range is analyzed. Results obtained show the proportionality of the peak-gain conditions for the SOA on the nonlinearity of the output gain achieved by the input pulses.