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Effects of Recombination Processes on the Nonlinearity of Semiconductor Optical Amplifiers IKECHUKWU UME, LAMEKA BOOKER, MAKHIN THITSA, Old Dominion University, ECE OLD DOMINION UNIVERSITY TEAM — An optical signal traveling along the fiber often loses its strength and needs to be rejuvenated. Optical amplifiers perform amplification directly on the optical signal without optical-to-electrical and electrical-to-optical conversion. Especially, semiconductor optical amplifiers (SOA's), which use a semiconductor material as the laser gain medium could be integrated into monolithic photonic circuits. Therefore, SOA's are being considered as the building blocks of future all-optical networks. Since linear amplification of the signal is strongly desired for SOA's in many applications, it is important to determine the degree of nonlinearity in practical SOAs. In this paper the effects of recombination processes, namely: linear recombination, bimolecular recombination and Auger recombination on the nonlinearity of the SOA are investigated by using the Volterra series model.

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