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Nonlinear Process between Co-propagating Signal and Control Pulses in Semiconductor Optical Amplifiers

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Abstract: A nonlinear process between co-propagating signal and control pulses has been proposed and demonstrated numerically, based on semiconductor optical amplifiers (SOA). Results show that a Gaussian signal pulse with picosecond duration can be simultaneously amplified and compressed in a SOA by utilizing a co-propagating high-intensity control pulse. To obtain high quality signal pulse with high peak power level and short pulse width, the center carrier wavelengths of two pulses should locate in the gain region of the SOA. The initial delay time between both pulses should be tuned suitably before entering the SOA.

Key Words: Nonlinear optics; pulse propagation and shaping; semiconductor optical amplifiers

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