Abstract

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Nonadiabatic Amplification of Train of Solitons in EDFA

The evolution of a soliton and a train of solitons of high bit rate in single mode-step index fiber including an erbium doped fiber amplifier (EDFA) is studied. The suggested model, based on the wave equation of the carrier envelope and the two energy level system, is used to study this evolution this amplifier. The polarization induced term representing the effect of doping atoms on the propagating electric field is obtained by solving Maxwell-Bloch equations. By adding the induced polarization to the nonlinear Schrödinger equation (NSE), the Fourier-split method is used to solve NSE in the EDFA. The doping level controls the gain and limits the propagation length of the train solitons of higher bit rate.