



Theory of passively-mode-locked fiber lasers with phase-modulated square pulses

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Résumé en anglais

We present results of the analysis of square pulses generated in passively-mode-locked lasers under dissipative-soliton-resonance conditions. The master equation used in this work takes into account the gain saturation, the quadratic frequency dispersion of the gain and the refractive index, and the cubic-quintic nonlinearity of the losses and refractive index. The phase modulation effects are defined as a perturbation to the solution of this equation that has the form of a square pulse without phase modulation. An analytical dependence of the change in the carrier frequency of the radiation along the pulse is found. Conditions for the occurrence of the singlet and doublet spectra of the square pulse are determined. The mechanisms responsible for the occurrence of this regime are analyzed. The obtained analytical dependencies are in good agreement with the results of numerical simulation.

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