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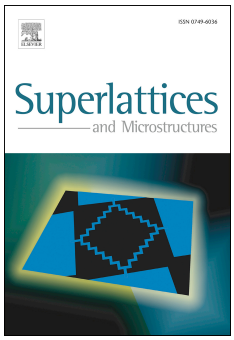

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Dark solitons for a system of the (2+1)-dimensional coupled nonlinear Schrödinger equations with time-dependent coefficients in optical fibers

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Abstract

In this paper, under investigation is a system of the (2+1)-dimensional coupled nonlinear Schrödinger equations with time-dependent coefficients, which could describe the attosecond pulses in optical fibers. Bilinear forms and dark soliton solutions are derived via the Hirota method. Effects of perturbation function $\alpha(t)$ on the dynamics of the solitons are analyzed and the optimal input function is given to make the optical solitons continue to propagate with an expected speed when a perturbation happens. More than that, we analyze the effect of $\alpha(t)$ on the interaction of the two dark solitons. Last we illustrate the elastic interaction between the two solitons graphically.

Keywords: Optical fibers; (2+1)-dimensional coupled variable-coefficient nonlinear Schrödinger equations; Dark soliton solutions; Elastic interaction

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