Self-induced transparency solitons in nonlinear refractive periodic media.

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Self-induced transparency solitons in nonlinear refractive periodic media

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Abstract

We obtain new nonstationary soliton-like solutions for an extended version of the classical massive Thirring model which, in nonlinear optics, describes Bragg-resonant wave propagation in a periodic Kerr medium. These solitons represent intense optical wavetrains whose envelope travels unchanged through a distributed feedback reflection filter, in spite of the fact that the mean wavelength of the soliton is in the center of the forbidden gap. The soliton group velocity may be anywhere between zero and the speed of light in the medium.

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