

Parametric Gap Solitons in PT-Symmetric Optical Structures

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It is well known that quadratic nonlinearity and feedback through Bragg periodicity are the basis for parametric gap solitons. The major part of the relevant investigations refers to passive systems. At the same time, optical systems supplemented with active elements can demonstrate unusual properties. Asymmetry intrinsic to structures with parity-time (PT) symmetry is a bright confirmation of this statement. The interplay of nonlinearity, Bragg reflection and gain/loss profile can lead to the complicated pattern of wave interactions and novel results. In this study, we address the properties of two-color solitons in complex PT-symmetric periodic structures with quadratic nonlinearity. We focus on the case of double Bragg resonance. We reveal the region of parameters where stable parametric solitons may exist. We demonstrate that characteristics of forming solitons depend on the side of radiation incidence.