

Spatial solitons in defocusing Kerr media with PT-symmetric potentials

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Abstract:

We provide a brief review of recent studies of spatial solitons in defocusing Kerr media with PT-symmetric potentials. Bright, dark and gray solitons all exist in the system. For bright solitons, an exact one-dimensional solution and a closed two-dimensional solution are found. The degree of nonlocality can influence the stability of bright solitons. Both a symmetry-breaking bifurcation destabilizing the dark solitons that leads to nonstationary dynamics, as well as a nonlinear analog of the PT transition that eventually terminates both the ground state and the dark soliton branch, yielding purely gain-loss dynamics. In addition, simulated results show that there are two kinds of gray solitons, the dip-shaped gray solitons and the hump-shaped solitons, and they can be stable in certain conditions.