

Nonlinear localized modes at phase slips in two-dimensional photonic lattices

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We analyze the existence and stability of nonlinear modes localized at phase-slip waveguide channels and their intersections in two-dimensional photonic lattices with rectangular symmetry. While in linear lattices only one localized mode of this type may exist under special conditions, nonlinearity supports a variety of localized modes including the modes which bifurcate from the symmetric states and describe nonlinear asymmetric localized states. We also study the surface modes localized at the waveguide channel edges in such lattices. © 2009 The American Physical Society.