

Internal degrees of freedom in perturbed nonlinear Klein-Gordon equations

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Abstract

We investigate the kink solutions to the generalized nonlinear Klein-Gordon equation in the presence of inhomogeneous forces and nonlocal operators.

We have found that the number of kink internal modes can depend on the asymptotic behavior of the kink solution for large values of $|x|$.

A list of mechanisms that are capable to create new kink internal modes would contain some of the following items: inhomogeneous perturbations that generate unstable equilibrium positions for the kink, extended de-localized and space-dependent perturbations, external perturbations that do not decay exponentially, and nonlocal operators.

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