Lattice Model with Traveling Compactons

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Abstract: We introduce a purely anharmonic lattice model with specific double-well on-site potential, which admits traveling compacton-like solitary wave solutions by the inverse method with the help of Mathematica. By properly choosing the shape of the solitary wave solution of the system, we can calculate the parameters of the specific on-site potential. We also found that the localization of the compacton is related to the nonlinear coupling parameter C_{nl} and the potential parameter V_0 of the on-site potential, and the velocity of the propagation of the compacton is determined by the localization parameter q and the potential parameter V_0. Numerical calculation results demonstrate that the narrow compacton is unstable while the wide compacton is stable when they move along the lattice chain.

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