Dynamics of Discrete Breathers
in Normal Modes in a Symmetric Lattice

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Abstract:A nonlinear lattice which has a particular symmetry supports smooth mobility of discrete breathers (DBs) or intrinsic localized modes (ILMs). This lattice, that is called the pairwise interaction symmetric lattice (PISL), is an extension of Fermi-Pasta-Ulam (FPU) β lattice and is invariant with respects to a certain map in the complex normal mode coordinate. In this study, we numerically investigate interaction between DB and normal modes in both FPU-β lattice and PISL. Difference of dynamics of DB is discussed from the viewpoint of the symmetry of lattices.

Keywords: Discrete breather, Intrinsic localized mode, Fermi-Pasta-Ulam β lattice, Pairwise interaction symmetric lattice.