

Soliton Solutions, Pairwise Collisions and Partially Coherent Interactions for a Generalized (1+1)-Dimensional Coupled Nonlinear Schrödinger System via Symbolic Computation

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Z. Naturforsch. **63a**, 679 – 687 (2008); received April 15, 2008

With the aid of symbolic computation, we investigate a generalized (1+1)-dimensional coupled nonlinear Schrödinger system with mixed nonlinear interactions, which has potential applications in nonlinear optics and elastic solids. The exact analytical one-, two-, and three-soliton solutions are firstly obtained by employing the bilinear method under two constraints. Some main propagation and interaction properties of the solitons are discussed simultaneously. Moreover, some figures are plotted to graphically analyze the pairwise collisions and partially coherent interactions of three solitons.

Key words: Soliton Solution; Coupled Nonlinear Schrödinger System; Pairwise Collision; Partially Coherent Interaction; Symbolic Computation.