

General Solution and Localized Coherent Soliton Structures of the (2+1)-Dimensional Generalized Davey- Stewartson Equations

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Abstract: In this paper, the variable separation approach is used to obtain localized coherent structures of the (2+1)-dimensional generalized Davey-Stewartson equations: $i q_t + (1/2)(q_{xx} + q_{yy}) + (R+S)q = 0$, $R_x = -(\sigma/2)|q|_y^2$, $S_y = -(\sigma/2)|q|_x^2$. Applying a special Bäcklund transformation and introducing arbitrary functions of the seed solutions, an abundance of the localized structures of this model is derived. By selecting the arbitrary functions appropriately, some special types of localized excitations such as dromions, dromion lattice, breathers, and instantons are constructed.

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Key words: variable separation approach, generalized Davey-Stewartson equations, coherent structure

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