

# Variable Separation Approach for the Sine-Gordon System

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Using the Bäcklund transformation and a variable separation approach with some arbitrary functions, three new types of solutions of the sine-Gordon system have been obtained. The excitations are localized as well as non-localized. E.g. solitons, dromions, multidromions, lumps, breathers, instantons, multivalued solitary waves, doubly periodic waves, etc., can be constructed on the basis of selecting the arbitrary functions properly. Also the interaction properties for all the possible localized excitations are of interest. In this paper, we discuss two elastic interactions. – PACS Ref: 05.45.Yv, 02.30.Jr, 02.30.Ik.

*Key words:* Solitons; Sine-Gordon System; Variable Separation Approach; Interaction.