

Mathematical Physics

Breathers and solitons of generalized nonlinear Schrödinger equations as degenerations of algebro-geometric solutions

Caroline Kalla

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We present new solutions in terms of elementary functions of the multi-component nonlinear Schrödinger equations and known solutions of the Davey-Stewartson equations such as multi-soliton, breather, dromion and lump solutions. These solutions are given in a simple determinantal form and are obtained as limiting cases in suitable degenerations of previously derived algebro-geometric solutions. In particular we present for the first time breather and rational breather solutions of the multi-component nonlinear Schrödinger equations.

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