Chirped Self-Similar Solutions of a Generalized Nonlinear Schrödinger Equation

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An improved homogeneous balance principle and an F-expansion technique are used to construct exact chirped self-similar solutions to the generalized nonlinear Schrödinger equation with distributed dispersion, nonlinearity, and gain coefficients. Such solutions exist under certain conditions and impose constraints on the functions describing dispersion, nonlinearity, and distributed gain function. The results show that the chirp function is related only to the dispersion coefficient, however, it affects all of the system parameters, which influence the form of the wave amplitude. As few characteristic examples and some simple chirped self-similar waves are presented.

Key words: F-Expansion Technique; The Generalized Nonlinear Schrödinger Equation; Chirped Self-Similar Solutions; Propagate Self-Similarly.

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