

## Exact Analytical Solutions in Bose-Einstein Condensates with Time-Dependent Atomic Scattering Length

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**Abstract:** In the paper, the generalized Riccati equation rational expansion method is presented. Making use of the method and symbolic computation, we present three families of exact analytical solutions of Bose-Einstein condensates with the time-dependent interatomic interaction in an expulsive parabolic potential. Then the dynamics of two analytical solutions are demonstrated by computer simulations under some selectable parameters including the Feshbach-managed nonlinear coefficient and the hyperbolic secant function coefficient.

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Key words: NLS equation, soliton, symbolic computation

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