

## New Extended Jacobi Elliptic Function Rational Expansion Method and Its Application

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**Abstract:** In this paper, an extended Jacobi elliptic function rational expansion method is proposed for constructing new forms of exact Jacobi elliptic function solutions to nonlinear partial differential equations by means of making a more general transformation. For illustration, we apply the method to the (2+1)-dimensional dispersive long wave equation and successfully obtain many new doubly periodic solutions, which degenerate as soliton solutions when the modulus  $m$  approximates 1. The method can also be applied to other nonlinear partial differential equations.

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**Key words:** extended Jacobi elliptic function rational expansion method, rational formal Jacobi elliptic function solution, (2+1)-dimensional dispersive long wave equation

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