

# Double Wronskian Solution and Conservation Laws for a Generalized Variable-Coefficient Higher-Order Nonlinear Schrödinger Equation in Optical Fibers

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With applications in the higher-power and femtosecond optical transmission regime, a generalized variable-coefficient higher-order nonlinear Schrödinger (VC-HNLS) equation is analytically investigated. The multi-solitonic solutions of the generalized VC-HNLS equation in double Wronskian form is constructed and further verified using the Wronskian technique. Additionally, an infinite number of conservation laws for such an equation are presented. Finally, discussions and conclusions on results are made with figures plotted.

*Key words:* Generalized Variable-Coefficient Higher-Order Nonlinear Schrödinger Equation; Double Wronskian Solution; Wronskian Technique; Conservation Laws.