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Soliton Interaction in Multi-Core Optical Fiber: Application to WDM System

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Abstract : The analytical bright two soliton solution of the 3-coupled nonlinear Schrödinger equations with variable coefficients in birefringent optical fiber is obtained by Darboux transformation method. To the design of ultra-speed optical devices, Soliton interaction and control in birefringence fiber is investigated. Lax pair is constructed for N coupled NLS system through AKNS method. Using two soliton solution, we demonstrate different interaction behaviors of solitons in birefringent fiber depending on the choice of control parameters. Our results shows that interactions of optical solitons have some specific applications such as construction of logic gates, optical computing, soliton switching, and soliton amplification in wavelength division multiplexing (WDM) system.

Keywords : optical soliton, soliton interaction, soliton switching, WDM
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