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A New Integrable Reduction of the Coupled NLS Equation

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Abstract: The method of multiple scales is used to derive a new integrable coupled nonlinear Schrödinger equation (CNLS) as an amplitude equation from the coupled nonlinear Klein-Gordon Equation (CNKG). We also give the corresponding spectral problem and further reduce the derived equation into a finite dimensional integrable Hamiltonian system. Finally the integrability of the reduced system is deduced by using a perturbation analysis.

Key Words: Multiple Scales Method, Coupled nonlinear Klein-Gordon Equation, Coupled NLS Equation, Spectral Problem, Integrable Hamiltonian system. 1991 Mathematics Subject Classification: 35B20, 35Q53, 35Q55, 58G18.

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