Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Dynamics of Vector Solitons in Bose Einstein Condensates[1] MAJED O.D. ALOTAIBI, LINCOLN D. CARR, Colorado School of Mines — We analyze the dynamics of two-component vector solitons, namely bright-in-dark solitons, via variational approximations in Bose-Einstein condensates. We calculate the binding energy and the oscillation modes between the two components analytically for special cases. The variational approximation is based on hyperbolic secant (hyperbolic tangent) for the bright (dark) component, which leads to a system of ordinary differential equations for the evolution of the ansatz parameters. Analytical calculations are performed for same width components in the vector soliton, and numerical calculations extend the results to arbitrary widths. The system is described by a vector nonlinear Shrödinger equation appropriate to the mean field theory of Bose-Einstein condensates

[1]Funded by NSF

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Date submitted: 13 Nov 2013 Electronic form version 1.4