

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Domain wall soliton in a trapped spin-1 atomic Bose-Einstein condensate¹ WENXIAN ZHANG, Ames Laboratory, Iowa State University, Ames, Iowa 50011, USA, L. YOU, School of Physics, Georgia Institute of Technology, Atlanta, Georgia 30332, USA — Solitons are interesting phenomenon in nonlinear systems, including atomic Bose-Einstein condensates. We investigate numerically a soliton state of a ferromagnetically interacting spin-1 condensate confined in a cigar shaped harmonic trap. The dynamics of this soliton, described by the coupled Gross-Pitaevskii equations within the mean field theory frame, is stable and intimately related to the recently observed domain structures in spin-1 condensate and similar to the domain wall soliton in two-component condensates. We present a rotating reference frame in which the local spin dynamics of the soliton becomes time independent.

¹Supported by NSF.

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Date submitted: 13 Jan 2006

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