

Abstract Submitted  
for the DAMOP06 Meeting of  
The American Physical Society

**Spatio-Temporal Dynamics of Ferromagnetic, Spin-1, Bose Condensates in All-Optical Traps**<sup>1</sup> M.-S. CHANG, Q. QIN, E.M. BOOKJANS, W. ZHANG, P.F. GRIFFIN, L. YOU, M.S. CHAPMAN, Georgia Institute of Technology — We investigate spin domain formation in spin-1 condensates with ferromagnetic interactions. We show that domains generally form when all three Zeeman components co-exist, except when the system is close to the spinor ground state or the condensate is smaller than the minimum allowed domain size. We also observe spin waves created from coherent spin mixing that show good agreement with the coupled spinor Gross-Pitaevskii equations. Finally, we investigate the miscibility of different spin states and find results consistent with our previous determinations of the ferromagnetic nature of the spin dependent interactions in the  $^{87}\text{Rb}$   $F = 1$  spinor [1].

[1] M.-S. Chang, *et al.*, Phys. Rev. Lett. **92**, 140403 (2004)

<sup>1</sup>We gratefully acknowledge support from NSF and NASA

M.-S. Chang  
Georgia Institute of Technology

Date submitted: 23 Feb 2006

Electronic form version 1.4