Abstract Submitted
for the DAMOP14 Meeting of
The American Physical Society

Investigation of Kibble-Zurek Quench Dynamics in a Spin-1 Ferromagnetic BEC MARTIN ANQUEZ, BRYCE ROBBINS, THAI HOANG, XIAOYUN YANG, BENJAMIN LAND, CHRISTOPHER HAMLEY, MICHAEL CHAPMAN, Georgia Inst of Tech — We study the temporal evolution of spin populations in small spin-1 ^{87}Rb condensates following a slow quench. A ferromagnetic spin-1 BEC exhibits a second-order gapless (quantum) phase transition due to a competition between the magnetic and collisional spin interaction energies. The dynamics of slow quenches through the critical point are predicted to exhibit universal power-law scaling as a function of quench speed. In spatially extended condensates, these excitations are revealed as spatial spin domains. In small condensates, the excitations are manifest in the temporal evolution of the spin populations, illustrating a Kibble-Zurek type scaling.[1] We will present the results of our investigation and compare them to full quantum simulations of the system.

[1]B. Damski and W. H. Zurek, Phys. Rev. Lett. 99, 130402 (2007)

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Date submitted: 31 Jan 2014 Electronic form version 1.4