

Abstract Submitted  
for the DAMOP12 Meeting of  
The American Physical Society

**Two-Mode Vacuum Squeezing of Spin-Nematic Variables in a Spin-1 Condensate** CHRIS HAMLEY, COREY GERVING, THAI HOANG, BEN LAND, MARTIN ANQUEZ, MICHAEL CHAPMAN, Georgia Institute of Technology — Squeezed states allow interferometers to surpass the standard quantum limit of the Heisenberg uncertainty principle. Here we study spin-nematic squeezing of a spin-1 condensate following a quench through a nematic-ferromagnetic quantum phase transition. We observe up to -8.3 dB squeezing in the variance of the spin-nematic quadratures. This squeezing is observed for negligible occupation of the squeezed modes and is analogous to optical two-mode vacuum squeezing.<sup>1</sup>

<sup>1</sup>C.D. Hamley, C.S. Gerving, T.M. Hoang, E.M. Bookjans, and M.S. Chapman, “Spin-Nematic Squeezed Vacuum in a Quantum Gas,” To appear in *Nature Phys.*

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Date submitted: 31 Jan 2012

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