

Abstract Submitted
for the DAMOP09 Meeting of
The American Physical Society

Quantum Eraser for Improved Spin Squeezing in a Double-Pass Optical-Feedback Geometry COLLIN TRAIL, IVAN DEUTSCH, University of New Mexico — Squeezed collective atomic spin states can be generated using the Faraday effect, by passing light through an atomic sample twice, imprinting the spin component along the direction of the propagation of light on to the light on the first pass, and rotating the atoms proportionally to this spin component on the second pass, thus creating an effective nonlinearity (M. Takeuchi et al., 2005, Phys. Rev. Lett. 94, 023003). The squeezing produced is reduced by loss of light still entangled to the atoms. We show how this scheme can be improved by a quantum eraser effect, where measuring the light properly reduces it's entanglement to our atomic sample. Grant NSF 0653599

Collin Trail
University of New Mexico

Date submitted: 23 Jan 2009

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