

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Extreme Spin Squeezing Beyond Spin-1/2 Ensembles COLLIN TRAIL, LEIGH NORRIS, IVAN DEUTSCH, University of New Mexico — We consider a protocol for squeezing the collective spin of a cold atomic ensemble through coherent control of the spin and light-polarization interactions. By retro-reflecting a short pulse of light through the ensemble followed by a quantum eraser and phase matching, we achieve exponential scaling of the squeezing with optical density. We show how these results can be extended using state preparation and mapping techniques for $s_j \geq 1/2$ systems, and extend our model of photon-atom scattering to account for decoherence in the higher dimensional case.

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Date submitted: 18 Nov 2010

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