

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Coherent population trapping of hyperfine-coupled single spins in diamond ANDREW GOLTER, NIMA DINYARI, HAILIN WANG, University of Oregon — Coherent population trapping (CPT) provides a highly sensitive means for probing the energy level structure of an atomic system. For diamond nitrogen vacancy (NV) centers, this technique offers an alternative to the standard optically-detected magnetic resonance (ODMR) for measuring the hyperfine structure of the electronic ground states. Here, we report an experimental study using CPT to probe the hyperfine splitting of these states as well as the Autler-Townes effect induced by a strong resonant microwave field. This nuclear spin dependent CPT was also employed along with other coherent spin operations for the initialization and manipulation of hyperfine-coupled nuclear spins. In addition, the use of CPT process to incorporate NV centers into a cavity QED system will be discussed.

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Date submitted: 09 Nov 2012

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