

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Coherent population trapping of a nitrogen vacancy center induced by optical and surface acoustic waves THEIN OO, ANDREW GOLTER, HAILIN WANG, University of Oregon — We report experimental demonstration of coherent population trapping (CPT) driven by resonant optical and mechanical coupling in a nitrogen vacancy (NV) center in diamond. A surface acoustic wave (SAW) is generated with an inter-digital transducer fabricated on a ZnO layer sputtered on diamond surface. The SAW couples resonantly to a transition between two excited states of the NV center, while a laser field couples to a corresponding resonant optical transition. The combined optical and mechanical coupling to the lamda- or ladder- type three-level system leads to CPT of the NV center. These studies open the door to exploiting strong excited-state electron-phonon coupling for applications such as laser cooling of a mechanical resonator and mechanically-mediated spin entanglement.

Hailin Wang
University of Oregon

Date submitted: 05 Nov 2015

Electronic form version 1.4