

Abstract Submitted
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Dressed-State Resonant Coupling between Bright & Dark Spins in Diamond¹ CHINMAY BELTHANGADY, NIR BAR-GILL, Harvard Smithsonian Center for Astrophysics & Department of Physics Harvard University, LINH MY PHAM, School of Engineering and Applied Sciences, Harvard University, KEIGO ARAI, Department of Physics, Massachusetts Institute of Technology, DAVID LE SAGE, Harvard Smithsonian Center for Astrophysics & Department of Physics Harvard University, PAOLA CAPPELLARO, Nuclear Science and Engineering Department, Massachusetts Institute of Technology, RONALD WALSWORTH, Harvard Smithsonian Center for Astrophysics & Department of Physics, Harvard University — Nitrogen-vacancy (NV) color centers in diamond have attracted wide interest recently for applications in quantum information processing and sensing. We demonstrate a scheme to resonantly couple bright NV electronic spins to dark substitutional-Nitrogen (P1) electronic spins by dressing their spin states with oscillating magnetic fields. This resonant coupling mechanism can be used to transfer spin polarization from NV spins to nearby dark spins and could be used to cool a mesoscopic bath of dark spins to near-zero temperature, thus providing a resource for quantum information and sensing, and aiding studies of quantum effects in many-body spin systems.

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