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Advances in nano-NMR using nitrogen vacancy centers in diamond MARK KU, Harvard-Smithsonian Center for Astrophysics, EMMA ROSENFELD, Harvard University Department of Physics, TREVOR DAVID RHONE, DOMINIK BUCHER, HUILIANG ZHANG, RONALD WALSWORTH, Harvard-Smithsonian Center for Astrophysics — We present recent progress in the development of new techniques for nanoscale NMR using nitrogen vacancy (NV) centers in diamond. Resonant transfer of polarization from an NV center to the nuclear spin bath using a dressed-state scheme (spin lock) enables identification of target nuclear spins without the spurious harmonics present in dynamical decoupling measurements. Furthermore, developments in diamond nano-beams containing shallow NVs provide a means to perform nanoscale NMR studies of solid-state systems. These advances - giving rise to a selective, sensitive and nanoscale probe - create new avenues for NMR studies of condensed matter and biological systems at the nanoscale.

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