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**Magnetic imaging of a single electron spin using a scanning NV magnetometer under ambient conditions** MICHAEL GRINOLDS, SUNGKUN HONG, PATRICK MALETINSKY, LAN LUAN, RONALD WALSWORTH, MIKHAIL LUKIN, AMIR YACOBY, Harvard University — It has long been an outstanding challenge to develop a magnetometer capable of detecting individual spins under ambient conditions. Nitrogen-vacancy (NV) centers are an attractive candidate for such a sensor, as even at room temperature their spins can be initialized and read out optically, have long coherence times, and are localized on atomic lengthscales. Here we present measurements using a scannable NV center to magnetically image the dipole field of a single electron spin. For a target spin, we chose to use an additional NV spin as it can be initialized and driven independently from other proximal spins, allowing us to perform dynamical decoupling schemes on both sensing and target NV spins. Magnetic images are taken under ambient conditions and are achieved through optimizing NV magnetic sensitivity (<60 nT/sqrt(Hz)) as well as minimizing the distance between the NV center and our target spin (<50nm).

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