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【818】 Nanoscale Magnetic Imaging of Artificial Spin Ices Using Single Spins in Diamond

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The Nitrogen-Vacancy (NV) defect center is a stable, atomic-scale defect containing a single electron spin, which, when integrated into the tip of an atomic force microscope, enables high resolution, quantitative magnetic imaging. Here, we present NV magnetic field imaging and relaxometry to probe static magnetization and GHz spin dynamics in artificial kagome spin ice. Due to the NV center's non-invasive nature we can probe nanoscale fluctuations even in the superparamagnetic regime. We present spatial magnetic field maps, allowing us to verify local ice rules. We further show relaxation images of spin dynamics, which indicate localized fluctuations in the 3 GHz spectral band.

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