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A Fiber-Based NV Center Microscope for Magnetic Field Imaging

We present the development of a scanning fiber-based nitrogen-vacancy (NV) center microscope for magnetic imaging under ambient conditions. The system integrates a microdiamond containing a high density of NV centers affixed to the end of an optical fiber, enabling remote excitation and collection of NV fluorescence. The sample is mounted on a 3D nanopositioning stage below the fiber tip, allowing precise scanning across the sample surface. By employing optically detected magnetic resonance (ODMR), the microscope is capable of mapping local magnetic fields with 150 micron resolution. We demonstrate magnetic imaging of battery cathode materials and discuss the system's sensitivity, spatial resolution, and potential for time-domain measurements.

Topical Area

Emerging research and multimodal techniques

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