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New approach for super-resolution imaging of NV-nanodiamonds KEIGO ARAI, MIT, DAVID LE SAGE, NIR BAR-GILL, CHINMAY BELTHANGADY, DAVID GLENN, Harvard-Smithsonian, MY LINH PHAM, Harvard University, HUILIANG ZHANG, RONALD WALSWORTH, Harvard-Smithsonian — We describe a new approach for super-resolution imaging of nanodiamonds (NDs) containing NV centers. The random orientation of NDs in a static magnetic field allow each ND to be distinguished by the NV ESR Zeeman shift and spin-state-dependent fluorescence rate. We exploit this behavior as a photo-switch such that adjacent NDs emit fluorescence sequentially in time. Post-analysis of a series of images at each ESR resonance frequency can localize individual NDs with sub-wavelength resolution. This technique has the advantage of being compatible with CCD-based wide-field microscopy, and involves significantly less laser intensity and experimental complexity than STED-based approaches.

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