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Spectroscopically Resolved Imaging of Spin Dynamics in Ferromagnets Using Nitrogen-Vacancy Centers in Diamond CHRISTOPHER WOLFE, VIDYA BHALLAMUDI, SERGEI MANUILOV, HAILONG WANG, CHUNHUI DU, RICHELLE TEELING-SMITH, CAROLA PURSER, ANDREW BERGER, ROHAN ADUR, FENGYUAN YANG, P. CHRIS HAMMEL, The Ohio State University Department of Physics — Understanding ferromagnetic dynamics is important for the development of future nanoscale spintronic and magnonic devices. Nitrogen-vacancy centers (NV) in diamond provide us with one of the few tools that has been shown to be capable of both broadband spectroscopy of ferromagnetic resonance[1] and nanometer scale imaging of magnetic fields[2]. Towards the goal of studying ferromagnetic dynamics at the nanoscale, we report recent results of the local spectroscopy of spin dynamics in ferromagnetic materials using NV centers. We see an especially strong coupling to low frequency excitations such as domains and domain walls, and observe a clear spatial dependence of the excitation of different spin wave modes.

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