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**Optically Detected Ferromagnetic Resonance in Metallic Ferromagnets Via Off-Resonant Detection of Nitrogen Vacancy Centers in Diamond** MICHAEL R. PAGE, VIDYA P. BHALLAMUDI, JOE SCHULZE, CAROLA M. PURSER, SERGEI MANUILOV, CHRISTOPHER WOLFE, JACK T. BRANGHAM, FENGYUAN YANG, P. CHRIS HAMMEL, The Ohio State University Department of Physics — We report optical detection of ferromagnetic resonance in thin film metallic ferromagnets using a recently discovered approach employing nitrogen vacancy centers in nanodiamonds. While conventional optically detected magnetic resonance measures magnetic fields through their impact on the magnetic resonance frequency of the nitrogen vacancy center, we measure a change in the nitrogen vacancy center photoluminescence at the ferromagnets resonance condition without need to work at the NV resonance frequency. This measurement technique allows sensitive, local detection of ferromagnetic resonance and can enable the study of magnetic dynamics at the nanoscale in a wide range of materials. While this measurement protocol was first reported in the study of ferromagnetic resonance in YIG, here we demonstrate the measurement in commonly used metallic ferromagnets to establish the generality of the technique and open the possibility of measuring nanoscale patterned devices and magnetic textures based on metallic ferromagnets of both commercial and scientific interest.

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