

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Imaging the Vector Magnetic Field of Magnetospirillum Gryphiswaldense by Optically Detected Magnetic Resonance using Nitrogen-Vacancy Centers in Diamond¹ RICHELLE M. TEELING, YOUNG WOO JUNG, INHEE LEE, JUSTIN NORTH, ROBIN NAKKULA, ROHAN ADUR, EZEKIEL JOHNSTON-HALPERIN, MICHAEL G. POIRIER, P. CHRIS HAMMEL, The Ohio State University — Nitrogen vacancy centers in diamond are single-spin systems that are stable under ambient conditions with strong optical spin transitions, making them optimal for room-temperature detection of nanoscale magnetic fields using optically detected magnetic resonance (ODMR). We use these ensembles of diamond spins as a scanned probe magnetometer to map the field emitted by Magnetospirillum Gryphiswaldense, in vivo. These bacteria mineralize nanoscale magnetite particles in their internal vesicles. Imaging these living bacteria cells will serve as a strong foundation for the application of our ODMR technique to the medical field, where the bacteria can be used to synthesize functionalized magnetic particles which can be used as biomarkers and targeted drug-delivery systems.

¹Funding Provided by the Center for Emergent Materials at the Ohio State University, an NSF MRSEC (Award Number DMR-0820414)

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Date submitted: 19 Nov 2010

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