

Abstract Submitted
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Advances in Rock Magnetometry Enabled by Nitrogen-Vacancy Magnetic Imaging DAVID GLENN, PAULI KEHAYIAS, Harvard University, ROGER FU, EDUARDO LIMA, BENJAMIN WEISS, Massachusetts Institute of Technology, RONALD WALSWORTH, Harvard University — Magnetic imaging using nitrogen-vacancy (NV) centers in diamond allows qualitatively new questions to be addressed in the field of paleomagnetism. The NV-diamond magnetic microscope provides sensitive magnetic imaging with resolution of approximately 1 micron at room temperature, enabling spatially heterogeneous magnetic sources in rock samples to be resolved at this scale for the first time. We describe new work using NV-based techniques to isolate magnetic grains in ancient terrestrial minerals (zircons), as well as ongoing investigations of several meteorite samples with interesting magnetic properties. Finally, we demonstrate the possibility of making spatially-resolved hysteresis measurements in-situ, providing a new tool for the characterization of magnetic grain sizes and composition at the micron scale.

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