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Scanning probe magnetometer using a nitrogen-vacancy defect center in diamond SUNGKUN HONG, PATRICK MALETINSKY, MIKE GRINOLDS, MIKHAIL LUKIN, RON WALSWORTH, AMIR YACOBY, Harvard University — Imaging weak magnetic signals down to the individual spin level with nanometer-scale spatial resolution has been a long standing goal due to its possible impacts in biological and physical sciences [1]. Recent experiments [2,3] have demonstrated that nitrogen-vacancy(NV) defect centers in diamond can serve as an excellent sensor, enabling above-mentioned conditions even at room temperature. Here, we report our recent progress in the development of a scanning probe magnetometer, which consists of an atomic force microscope, a single NV center at the apex of the tip, and a confocal microscope. We will present a detailed description of our setup, its operating principles and specifications.

[1] D. Rugar *et al.* *Nature* 430, 329 (2004)
[2] J. Maze *et al.* *Nature* 455, 644 (2008)
[3] G. Balasubramanian *et al.* *Nature* 455, 648 (2008)

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