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Nanoscale Sensing with Nitrogen Vacancy Centers ELANA URBACH, IGOR LOVCHINSKY, ALEX SUSHKOV, HONGKUN PARK, MIKHAIL LUKIN, Harvard University — In the last several decades Magnetic resonance imaging (MRI) has emerged as a powerful tool in science and technology. Conventional MRI technology, however, relies on measuring magnetic fields from a large (macroscopic) number of molecules, for example tissues in specific areas of the brain. Extending these techniques to the nanoscale could enable revolutionary advances in the physical, biological and medical sciences. Here we report on recent progress in using Nitrogen-Vacancy (NV) centers in diamond to detect small numbers of nuclear spins in biological molecules. In particular, we have demonstrated detection of single proteins attached to the diamond surface.

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