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Microscopic ESR study of N@C_{60} using a Magnetic Resonance Force Microscope P. BANERJEE, D. V. PELEKHOV, K. C. FONG, I. H. LEE, P. C. HAMMEL, Dept. of Physics, Ohio State University, Columbus OH 43210, W. HARNEIT, Institut für Experimentalphysik, Freie Universität Berlin, Arnimallee 14, D-14195 Berlin, Germany — We report electron spin resonance studies of the endohedral fullerene N@C_{60} using the novel technique of magnetic resonance force microscopy (MRFM). These studies are performed at temperatures down to 1 K on both thin films of N@C_{60} and in samples where the endohedral fullerene is incorporated into a bulk crystalline matrix[1]. Utilizing the large magnetic field gradients ($\sim 10^5$ Tesla/meter) in the vicinity of our micromagnetic probe tip, we are able to selectively probe the electron spins in sub–micron volumes. Further, our schemes for spin manipulation allow us to measure the spin–lattice relaxation rate (T_1^{-1}) with a spatial resolution in one dimension of approximately 20 nanometers. We will also discuss our efforts to improve the sensitivity of our microscope for detecting *individual* electronic spins.

[1]B. Naydenov, C. Spudat, W. Harneit, H. I. Suss, J. Hullinger, J. Nuss, M. Jansen, Chem. Phys. Lett., 424, 327 (2006)

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