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Fluctuations of g factors of discrete levels in ferromagnetic nanoparticles[1] DRAGOMIR DAVIDOVIC, WENCHAO JIANG, FELIPE TIJIWA BIRK[2], PATRICK GARTLAND, School of Physics, Georgia Institute of Technology — It has been known that the interplay between electron-electron interactions and spin-orbit scattering can cause a wide distribution of g factors in tunneling spectra of metallic nanoparticles, including g-factors much larger than 2 if electron-electron interactions are strong. Here, we present our studies of single Co nanoparticles in $Al/Al_2O_3/(Co\ nanoparticles)/Al_2O_3/Al$ tunnel junctions using electron tunneling spectroscopy at mK-temperatures. The g factor of discrete energy levels exhibits significant difference between minority-spin and majority-spin levels. We have clearly observed large g factors (≈ 6) in one sample at magnetic field greater than 4T, suggesting $\Delta S = 3/2$ in the tunneling transition, S is the magnitude of the spin. We will present the latest results on tunneling junctions containing Ni, Permalloy or Gd nanoparticles, which have weaker magnetic anisotropy fluctuations.

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