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Gate-tunable magnetic exchange and giant g-factor fluctuations in InAs nanowire quantum dots SZABOLCS CSONKA, LUKAS HOFSTETTER, FRANK FREITAG, STEFAN OBERHOLZER, CHRISTIAN SCHONENBERGER, Department of Physics, Univ. of Basel, THOMAS SAND JESPERSEN, MARTIN AAGESEN, JESPER NYGARD, Niels Bohr Institute, Copenhagen, NANOELECTRONICS GROUP AT BASEL TEAM, NANOSCALE QUANTUM ELECTRONICS GROUP AT THE NANO-SCIENCE CENTER TEAM — We use the spin-1/2 Kondo effect, which is observed in every other charge ground state with odd elec-trons, to measure the field-induced splitting of the spin-doublet, and hence the g- factor. We do this in hybrid quantum dots using both normal (N), ferromagnetic (F) and superconducting (S) contacts. Unlike to previous studies, the g-factors of neighboring states can vary a lot: g can scatter between 2 and 18 and can therefore be even larger than in the bulk ($g \sim 15$). We demonstrate further the electric gate tunability of the g- factor in a single charge state. When using F contacts, a zero- field split-ting is induced. This proximity induced exchange field has recently been measured for the first time by Hauptmann et al. (Nature Physics **4**, (2008)) in carbon nanotubes. Here, we show the same ef-fect in a semiconducting nanowire, demonstrating that this effect is universal. Employing a pair of S and F contacts, the proximity-induced exchange shows up as a minigap in superconducting spectroscopy.

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