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Analysis of unusual splitting of Kondo peak in the differential conductance of a carbon nanotube quantum dot JEFFREY STEPHENS, JEROME LICINI, Lehigh University, A.T. CHARLIE JOHNSON, DOUG STRACHAN, DANVERS JOHNSTON, SAM KHAMIS, University of Pennsylvania — Carbon nanotubes grown by chemical vapor deposition on an oxidized silicon substrate were contacted to form a gated sample of parallel tubes. Testing was done at low temperature and high magnetic field using a dilution refrigerator and superconducting magnet. The current versus voltage graph shows asymmetry with respect to zero volts. The differential conductance (dI/dV) is computed and yields some intriguing behavior. The previous asymmetry is more apparent as is a sharp increase in conductivity near zero voltage. Temperature data further suggests a conductance peak at near zero voltage consistent with the Kondo effect. High magnetic fields, 0 to 11 Tesla in 0.5 Tesla increments, are used to probe the conductance behavior. The magnetic field tests yield unusual shapes and splitting at two critical fields.

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