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Transport and Charge Sensing in ^{12}C and ^{13}C Carbon Nanotube Double Quantum Dots[1] HUGH CHURCHILL, Harvard University, DAVID MARCOS, Harvard University/Consejo Superior de Investigaciones Cientificas, ANDREW BESTWICK, JENNIFER HARLOW, Harvard University, CAROLYN STWERTKA, SUSAN WATSON, Harvard University/Middlebury College, CHARLES MARCUS, Harvard University — We report measurements of gate-defined carbon nanotube double quantum dot devices with a charge sensor fabricated on the same nanotube. The methane used during growth controls the ^{13}C content of the nanotubes. ^{12}C nuclei have zero nuclear spin, and ^{13}C nuclei have spin 1/2. We compare samples with natural abundance (1%) and enriched (99%) ^{13}C content. A strong isotope effect is observed in the magnetic field dependence of transport at finite bias. Fast control of these devices is demonstrated using a pulsed-gate technique.

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