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Low temperature electron transport spectroscopy of mechanically templated carbon nanotube quantum dots[1] SAIFUL KHONDAKER, University of Central Florida, PAUL STOKES, UNIVERSITY OF CENTRAL FLORIDA TEAM — We report on the low temperature electronic transport measurements of mechanically templated carbon nanotube quantum dots (QDs). The devices were fabricated by precise dielectrophoretic placement of single walled carbon nanotubes (SWNTs) between 1 μm spaced Pd electrodes and over a local Al/Al_2O_3 bottom gate. The local gate defines the quantum dot due to the bending of SWNT at the edges of the gate, as well as controls its operation [1]. We performed detailed transport spectroscopy measurements of the templated SWNT QDs to determine how the tunnel barriers evolve with both the global back gate and local gate voltage. We will present models to explain the evolution of these devices as a function of local gate and back gate voltage. This study may allow for future size tunabiliy of SWNT QDs by further control over the tunnel barrier transparency and source, drain, and gate capacitance to fabricate room temperature single electron transistors.

[1] Paul Stokes and Saiful I. Khondaker, Appl. Phys. Lett. **92**, 262107 (2008).

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