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Origin of hysteresis in gate-modulated transport in single-wall carbon nanotubes SWASTIK KAR, ARAVIND VIJAYARAGHAVAN, Department of Materials Science and Engineering, Rensselaer Polytechnic Institute, Troy New York, SAIKAT TALAPATRA, Rensselaer Nanotechnology Center, Rensselaer Polytechnic Institute, Troy New York, CATERINA SOLDANO, SAROJ K. NAYAK, Department of Physics, Applied Physics and Astronomy, Rensselaer Polytechnic Institute, Troy New York, OMKARAM NALAMASU, PULICKEL M. AJAYAN, Department of Materials Science and Engineering, Rensselaer Polytechnic Institute, Troy New York — Transfer characteristics of gate-modulated transport in single-wall carbon nanotubes show significant hysteresis. This hysteresis is usually attributed to a screening of the gate voltage due to mobile charges/ions in the presence of a trapping/de-trapping mechanism within the gate architecture. From a temperature dependence of the hysteresis behavior, we suggest an alternate mechanism, where the screening charges are injected from the nanotube itself into the surrounding dielectric. Any trapping/de-trapping mechanism does not appear to play a significant role, and the experimental results can be understood in terms of a capacitive charging of the surrounding dielectric.

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