Abstract Submitted
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Electrical Switching in Metallic Carbon Nanotubes[1] HYOUNG JOON CHOI, Institute of Physics and Applied Physics, Yonsei University, Seoul, Korea, YOUNG-WOO SON, Department of Physics, University of California at Berkeley and Materials Sciences Division, LBNL, JISOON IHM, School of Physics, Seoul National University, Seoul, Korea, MARVIN L. COHEN, STEVEN G. LOUIE, Department of Physics, University of California at Berkeley and Materials Sciences Division, LBNL — We present first-principles calculations of quantum transport which show that the resistance of metallic carbon nanotubes can be changed dramatically with homogeneous transverse electric fields if the nanotubes have impurities or defects. The change of the resistance is predicted to range over more than two orders of magnitude with experimentally attainable electric fields. This novel property has its origin that backscattering of conduction electrons by impurities or defects in the nanotubes is strongly dependent on the strength and/or direction of the applied electric fields. We expect that this property will open a path to new device applications of metallic carbon nanotubes. Ref.) Young-Woo Son *et al.*, Phys. Rev. Lett. **95**, 216602 (2005).

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