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**Targeted Placement of Gold Nanoparticles on SWCNT Transistors Using Electrodeposition** YIAN LIU, PAOLA BARBARA, MAKARAND PARANJAPE, Department of Physics, Georgetown University, Washington, D.C. 20057, USA — We present a simple in-situ electrochemical method to target the deposition of gold and other metallic nanoparticles along a single-walled carbon nanotube (SWCNT) field effect transistor (CNTFET). The transistors, fabricated on SiO<sub>2</sub>/Si substrates, are passivated by a thin layer of poly(methyl-methacrylate), or PMMA. Areas of the PMMA along the carbon nanotube are exposed using electron-beam lithography to target the locations where Au nanoparticles need to be placed. An appropriate potential difference is applied between an in-situ sacrificial gold electrode and the SWCNT, all immersed under a droplet of electrolyte solution. By adjusting the applied voltage and time of deposition, the size of the Au nanoparticle can be controlled from 10 nm to over 100 nm. This method provides better control and is much easier to carry out compared to other site-specific deposition techniques. Such decorated Au nanoparticle/CNTFET heterostructures will allow for a better understanding of single-electron transport behavior, as well as finding application in site-specific biomolecule anchoring for the development of highly sensitive and selective biosensors.

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