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Sensor applications and spin-transport measurements in carbon nanotube nanocomposites J. SANDERS, J. GASS, H. SRIKANTH, Functional Materials Lab, Dept. of Physics, University of South Florida-Tampa, 33620, USA, F.K. PERKINS, E.S. SNOW, Nanotechnology Section, U.S. Naval Research Lab, Washington, D. C — Vertical and horizontal carbon nanotubes have been grown at USF using CVD and PECVD techniques with Ni and Fe nanoparticle catalysts. At NRL we have used CVD to produce carbon nanotube networks on SiO_2/Si^{++} substrates to build sensors for chemical and bio agents by measuring capacitance and conductance. Various chemical vapors are able to be sensed with a fast response and recovery as well as a high degree of selectivity. A microfluidic flow system has been developed to extend the sensing applications to biological analytes. It is also known that carbon nanotubes are excellent transmission channels for charge and spin transport. In addition to the biosensors, we will also report on our experiments probing charge and spin transport through nanotube networks using point contact Andreev reflection (PCAR) based on superconducting and ferromagnetic junctions.
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