TRANSISTOR FROM INDIVIDUAL NANOTUBES

Siegmar Roth, Po-Wen Chiu, Serhat Sahakalkan, Jannik Meyer, and Dirk Obergfell
Max Planck Institut fuer Festkoerperforschung, Stuttgart, Germany.

Siegmar Roth
Max Planck Institut fuer Festkoerperforschung
Heisenbergstr. 1, 70569 Stuttgart
T: +49 (711) 689-1434, F: +49 (711) 689-1010
e-mail: s.roth@fkf.mpg.de
http://www.mpi-stuttgart.mpg.de/KLITZING/research/nano/nano.html

The state of the art of preparing transistors based on individual single-walled carbon nanotubes will be reviewed. The "standard" nanotube transistor consists of a nanotube adsorbed on a silicon chip, contacted by e-beam lithographic metal leads, and switched by a large-area backgate. This transistor will be contrasted to the "all-carbon" transistor, where the gate is also a carbon nanotube and to the "peapod transistor", where the nanotube is "doped from the inside" by filling with metallofullerenes. The importance of in-situ visualizing the nanotubes in a transmission electron microscope will be pointed out and a technique will be presented which allows for such a visualisation.