Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Evidence for Gated Spin Transport through Individual Semiconducting Single-Wall Carbon Nanotubes.[1] TANESH BANSAL, BHASKAR NAGABHIRAVA, ADITYA MOHITE, PRASANTH GOPINATH, BRUCE ALPHENAAR, University of Louisville, NDRL AT UNIVERSITY OF LOUISVILLE TEAM — Using a short-channel fabrication technique we are able to characterize semi-conducting single-wall carbon nanotubes at lower temperature (4.2K) than previously possible. Using this technique we are able to observe evidence for gate controlled spin transport through a semi-conducting SWNT for the first time. At 300K the devices showed typical transistor behavior with a 500% change in conductance between on and off states. As the temperature decreases this behavior persists however, gate dependent conductance fluctuations appear superimposed on the standard semi-conducting gate dependence. SEM images reveal only a single nanotube between the contacts. Magnetic field dependent measurements show that spin mediated magnetoresistance follows the conductance of the device with respect to the gate voltage. Measurements reveal that the spin transport through the nanotube survives up to 30K.

[1]The work is supported by the Office of Naval Research (GB060468).

Tanesh Bansal
University of Louisville

Date submitted: 20 Nov 2006 Electronic form version 1.4