Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Iron Nanoparticle Driven Spin-valve Behavior in Aligned Carbon Nanotube Arrays* MARK B. MURPHEY, JEREMY D. BERGESON, STEPHEN J. ETZKORN, The Ohio State University, Columbus, Ohio 43210-1117, LIANGTI QU, JUNBING YANG, LIMING DAI, University of Dayton, Dayton, Ohio 45469-0246, ARTHUR J. EPSTEIN, The Ohio State University, Columbus, Ohio 43210-1117 — Spin-valve structures have been constructed from aligned arrays of carbon nanotubes, yielding a magnetoresistance reaching 25 %[1]. In addition to including vertically aligned carbon nanotube arrays, iron catalyst nanoparticles that form the array function as the second ferromagnetic electrode. Reversal of the magnetization of the electrode in an applied magnetic field results in a clear peak in the resistance of the device. A spin scattering length in excess of 9 μm shows excellent spin transport through the nanotube array. The effect of oxide barriers and device patternability are explored. 1. Bergeson, et al., Appl. Phys. Lett. **93**, 172505 (2008) *This work is supported in part by DOE Grant Nos. DE-FG02-86ER45271 and DE-FG02-01ER45931, and AFOSR Grant No. FA9550-06-1-0175 and FA9550-06-1-0384, NSF Grant No. CMS-0609077, and IMR Grant Nos. FG0004 and FG 0036. The support of the Materials and Manufacturing Directorate of the Air Force Research Laboratory is gratefully acknowledged.

Mark B. Murphey
The Ohio State University, Columbus, Ohio 43210-1117

Date submitted: 26 Nov 2008 Electronic form version 1.4