

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Synthesis, Characterization and Adaptability of Carbon Nanotube-Based Solid Lubricants** AMELIA CHURCH, XIANFENG ZHANG, Dept. of Physics at SIUC, BRANDON LUSTER, Dept. of Mechanical Engineering at SIUC, PUNIT KHOLI, Dept. of Chemistry at SIUC, SAMIR AOAUDI, SAIKAT TALAPATRA, Dept. of Physics at SIUC — We report on the experimental investigations of the tribological properties of carbon nanotube (CNT) based composites. Two different CNT composites were obtained by electro-depositing molybdenum disulfide ( $\text{MoS}_2$ ) and silver (Ag) on vertically aligned assemblies of CNTs. Both of the CNT based composites, CNT- $\text{MoS}_2$ , as well as CNT-Ag, showed substantially lower values of friction coefficients and wear rates than traditional thin films of  $\text{MoS}_2$ , and Ag. The adaptabilities of these composites under humid and non-humid conditions for CNT- $\text{MoS}_2$ , and high temperature cycling in the case of CNT-Ag composites, were also tested and will be presented. Our results indicate that the CNT- $\text{MoS}_2$  composites were able to sustain their lubricating properties under humid/non-humid cycling, whereas the CNT-Ag composites showed degradation of their frictional properties under high temperature cycling.

Amelia Church  
Dept. of Physics at SIUC

Date submitted: 18 Nov 2009

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