

Abstract Submitted  
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**Thermal Conductivity of Single Wall Carbon Nanotube (SWNT) Epoxy Composites** M.B. BRYNING, D.E. MILKIE, M.F. ISLAM, J.M. KIKKAWA, A.G. YODH, Dept of Physics and Astronomy, University of Pennsylvania — Pristine SWNTs were dispersed in epoxy to create composites. Our dispersion procedure achieved fairly uniform SWNT distributions without introducing stabilizing agents that could affect composite performance. We measured thermal and electrical conductivity of the resulting composites. Thermal conductivity increased continuously with increasing SWNT concentration, exhibiting an enhancement of about 30% at a volume fraction of  $\sim 0.01$ . In similar composites made with surfactant stabilized SWNTs, the thermal enhancement was weaker; volume fractions of  $\sim 0.03$  were needed to achieve a 30% increase. We contrast these findings with electrical measurements on the same samples, which show a percolation-like behavior with a sharp insulator-conductor transition. This work has been partially supported by the NSF through MRSEC grant DMR-0079909 and DMR-0203378, by DARPA/ONR grant N00015-01-1-0831, and by NASA through grant NAG8-2172.

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