

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Electric Field and Frequency Dependence of the Dielectric Storage, Loss, and Conductivity of Multi-Wall Carbon Nanotubes** RAJRATAN BASU, GERMANO IANNACCHIONE, Worcester Polytechnic Institute — The dielectric storage ( $\epsilon'$ ) and loss ( $\epsilon''$ ) of the complex dielectric constant ( $\epsilon^*$ ) are reported for multi-wall carbon nanotubes (MWCNT) up to  $10^5$  Hz as a function of ac-electric field amplitude  $E_{rot}$  (in-phase and same frequency as the measurement) and  $E_{ac}$  (fixed phase and frequency with respect to the measurement). A slow relaxation process (mode-1) is observed that increases in peak frequency with increasing  $E_{rot}$  but is independent of  $E_{ac}$ . A fast relaxation process (mode-2) is also observed that is independent of  $E_{rot}$  and shifts to higher frequency with increasing  $E_{ac}$  (opposite to that seen for mode-1). A conductivity analysis of MWCNT reveals possible mechanisms for how  $E_{rot}$  and  $E_{ac}$  can effect the dielectric dissipation differently.

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Date submitted: 27 Nov 2007

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