Electrical, Mechanical, and Morphological Characterization of Carbon Nanotube filled Polymeric Nanofibers RUSSELL GORGA[1], LAURA CLARKE[2], SETH MCCULLEN[1], SATYAJEET OJHA[1], WESLEY ROBERTS[2], N.C. State University — This work focuses on the inclusion of conductive nanotubes into polymeric matrices with the end goal of creating conductive nanocomposites. This investigation has been carried out by uniform dispersion of multi-walled carbon nanotubes in aqueous solutions of polyvinyl alcohol (PVA) and polyethylene oxide (PEO), which are inherently nonconductive polymers. To fabricate these structures we are using the electrospinning process encompassing an array of collection methods including parallel bars and a static plate. Carbon nanotubes are known to have excellent electrical conductivity and mechanical properties. This investigation shows that the inclusion of carbon nanotubes increases the electronic conduction in these polymers and enhances the mechanical properties of the composites. Dispersion of these nanotubes is the key factor in this process; gum Arabic and surfactants have been utilized for the dispersion of these nanotubes. Conductivity measurements have been carried out by two point probe method and by performing sensitive current and conductance measurements with a femtoammeter. Further morphological characterization has been performed using scanning electron microscopy (SEM) and transmission electron microscopy (TEM).

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Date submitted: 22 Nov 2005　　　　　　　　　　　　Electronic form version 1.4