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Electronic durability of flexible transparent coatings from type-specific single-wall carbon nanotubes JOHN M. HARRIS, MATTHEW R. SEMLER, NDSU, JEFFREY A. FAGAN, NIST, ERIK K. HOBBIE, NDSU — The coupling between mechanical flexibility and electronic performance is evaluated for thin flexible coatings of metallic and semiconducting single-wall carbon nanotubes (SWCNTs) deposited on compliant polymer supports. The microstructure, transparency, and electronic properties of the films are independently characterized using a variety of techniques. Cyclic compression experiments suggest that thin films made from metallic SWCNTs show better durability as flexible transparent conductive coatings, which we attribute to a combination of superior mechanical performance and higher interfacial conductivity. We model the role of van der Waals forces in the strain response of the films.

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