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Copper-coated Nanotubes at the Single Nanotube Scale DENG PAN, BRAD CORSO, O. TOLGA GUL, PHILIP COLLINS, University of California Irvine — High conductivity and high ampacity are both essential specifications for next-generation solid-state electronics. Recently, Subramaniam *et. al.* reported remarkable increases in copper conductivity and ampacity using a bulk composite of copper and carbon nanotubes (CNTs) [1]. Here, we describe similar measurements performed with a model system composed of individual single-walled or multi-walled CNTs. Cu electrodeposition upon single CNT devices achieved nanometer-scale coatings that were electrically tested as a function of film thickness and device temperature. We do not observe the same conductivity enhancements reported for bulk Cu-CNT composites, but improvements in ampacity has been observed when compared to pure Cu. The thinnest Cu films have the hightest ampacity, indicating that the CNT core is essential to the enhanced current capacity.

[1] C. Subramaniam *et. al.*, Nat. Comm. **4** (2013)

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