Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Transport in Carbon Nanotube – Polymer Field Emission Cathodes. DAVID CAREY, RICHARD SMITH, University of Surrey, NANOELECTRONICS GROUP TEAM — Embedding carbon nanotubes in host polymer matrices is an attractive way to control the nanotube density and provides a way to protect the nanotube emitter. Field emission from individual carbon nanotubes is usually discussed in terms of the field enhancement factor and electrostatic screening. The field enhancement factor can be regarded as the most important factor for efficient emission when transport of electrons is not the rate limiting step. Large area emission characterisation of cathodes tends to produce an ensemble average of the enhancement factor with sites with the lowest local turn on field emitting. We show that in nanotube polymer composites charge transfer through the composite and the effects of fluctuation induced tunneling due to variable nanotube-nanotube separation are important considerations.

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Date submitted: 16 Nov 2006 Electronic form version 1.4