

Abstract Submitted
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Large Area Applications and Current Transport Considerations in Carbon Nanotube Composites DAVID CAREY, THOMAS CONNOLLY, RICHARD SMITH, MATT LUKE, University of Surrey — Carbon nanotube (CNT) electronics can be broadly split into to single or few CNT-based architectures, such as that found in a transistor, or multiple nanotube based architectures such as in films or composites. Potential large area applications of the later include transparent electronics, nanocomposites for displays or lighting or in sensor technology. Crucial to the development of these applications is an understanding of the factors that control the current transport. In particular a key question to be asked is ‘what is the rate limiting step for electron transport?’ We have studied the field induced electron emission with low volume fractions of CNTs in PVA. We find that excellent emission can be found with as low as 1 vol. % CNTs - one of the lowest values reported for a nanocomposite cathode [1]. Below this concentration we find the rate limiting step for emission to be controlled by transport through the composite. We generalize our conclusions for other large area CNT based applications such as transparent electronics and next generation technologies. [1] Thomas Connolly, Richard C. Smith, Yenny Hernandez, Yurii Gun’ko, Jonathan N. Coleman and J. David Carey, *Small* **5**, 826 (2009).

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