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**Thermionic Emission Properties of Surface modified conical carbon nano tubes (CCNT)** ANDRIY SHEREHIY, GAMINI SUMANASEKERA, University of Louisville, Department of Physics and Astronomy, SANTOSHRUPA DUMPALA, MAHENDRA SUNKARA, University of Louisville, Department of Chemistry Engineering, ROBERT COHN, University of Louisville, Department of Electrical and Computer Engineering — We have studied field emission and thermionic emission properties of surface modified arrays of CCNTs. The CCNTs with narrow tip radii (about 10 nm) were synthesized using microwave plasma assisted chemical vapor deposition on platinum wire and planar graphite foils. They show enhanced field emission properties with geometrical enhancement factor as high as about 7000 and turn-on electric field as low as approximately  $0.7 \text{ V}/\mu\text{m}$ . The thermionic emission characteristics show work function of approximately 4.2 eV which is considerably lower than that of aligned MWNT (4.8 eV). The reduced work function value was further confirmed using ultraviolet photoemission spectroscopy (UPS). The surface modified CCNT arrays were also studied and shown to exhibit poorer emission properties compared to pristine CCNTs. We have further coated CCNTs with diamond nanocrystals and doping of the nanocrystals is underway.

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