

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

A New Thermionic Cathode Using Oxide Coated Carbon Nanotubes¹ CHRISTOPHER DAY, FENG JIN, YAN LIU, SCOTT LITTLE, Ball State University — We have demonstrated a new type of thermionic cathode utilizing carbon nanotubes that exhibited superior electron emission properties. A field enhancement factor as high as 2000 was observed and thermionic electron emission current at least an order of magnitude higher than the emission from a conventional oxide cathode was obtained. This cathode combines the low work function of the oxide coating with a high field enhancement factor introduced by carbon nanotubes and we have demonstrated that it can be used as a highly efficient electron source. The cathode was fabricated by sputter deposition of a thin film of oxide materials on aligned carbon nanotubes, which were grown on a tungsten substrate with plasma enhanced chemical vapor deposition.

¹This work is supported by the Department of Energy.

Christopher Day
Ball State University

Date submitted: 11 Jan 2006

Electronic form version 1.4