

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Thermionic cooling on barium strontium thin film surface<sup>1</sup>**

FENG JIN, GUOGANG QIAN, SCOTT LITTLE, Ball State University — Strong thermionic emission was observed from low-work-function barium strontium oxide thin films. Such strong thermionic emission resulted a large cooling effect on the emitting surface. Temperature drops as high as 90 °C was obtained. Barium strontium oxide [(BaSr)O] thin films approximately 1  $\mu\text{m}$  in thickness were deposited on tungsten substrates using RF magnetron sputter deposition. Thermionic emission from the thin film was characterized and the work function of the thin film was measured using Richardson line method. The temperature drop or cooling of the thin film surface at different emission current was measured using a high precision optical pyrometer.

<sup>1</sup>This work was supported by the Department of Energy under contract No. DE-FC26-04NT42329.

Feng Jin  
Ball State University

Date submitted: 27 Nov 2007

Electronic form version 1.4