

## **MAXIMUM SUPPRESSION OF QUANTUM SHOT NOISE FOR FIELD EMISSION FROM A SHAPE TIP\***

M. Pant and L. K. Ang

*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore 639798*

This paper presents a two-dimensional (2D) non-uniform model to study the suppression of shot noise for electron field emission from a sharp metallic tip due quantum partitioning of electron tunneling through the potential barrier near the metal-vacuum interface. To study the shape dependence, we have chosen two different geometrical profiles of the tip: Lorentzian and prolate spheroidal shape. It is found that Lorentzian field emitter will have a larger shot noise suppression. For a fixed work function and a given field emitter, there is a maximum suppression of shot noise (or minimum value of Fano factor), and it is independent on the sharpness of the emitter. Comparison with previous uniform models has indicated that prior results had over-estimated the shot noise suppression.

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