

SIMULATION AND MEASUREMENT OF VACUUM ELECTRON HOP FUNNEL IV CHARACTERISTICS AND ENERGY DISTRIBUTION*

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Electron hop funnel devices can be used to collect and spatially average electron emission current¹ from field emission arrays (FEAs). At high enough operating voltage, the funnels provide unity gain of the injected emission current, and the resulting beams can be more uniform than from typical FEAs. We are using these devices to develop microwave amplifiers using FEAs. In the work described here, hop funnels have been fabricated from Low Temperature Co-fired Ceramic (LTCC), and the electron energy distribution of the hop funnel electron beam, as well as the IV characteristics, have been measured. The data has been compared against simulation using the particle trajectory code Lorentz². Convergence of the code has been demonstrated for a number of different parameters and, from which, the base parameters were determined and have been used to generate the numerical simulation results for the IV curve and electron energy distribution of the hop funnel exit beam. The results of the simulation and measurement will be used to estimate the maximum secondary electron yield and the corresponding maximum energy of the electron secondary yield curve of LTCC.

1. B H W Hendriks, G G P van Gorkom, N Lambert, and S T de Zwart, J. Phys. D: Appl. Phys. **30** pp. 1252–1264 (1997).

2. www.integratedsoft.com

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