

Abstract Submitted
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Analysis of a new Extraction Aperture for the Nonambipolar Electron Source¹ JESSE GUDMUNDSON, NOAH HERSHKOWITZ, University of Wisconsin-Madison, LUTFI OKSUZ, Suleyman Demirel University — The Non-ambipolar Electron Source (NES) is a radio frequency plasma-based electron source that does not rely on electron emission at a cathode. All electrons are extracted at an electron sheath through a biased ring and all ions are lost radially to a separately biased cylindrical graphite Faraday shield. Plasma density increases and electron confinement at the ring improves by the addition of an axial magnetic field. An electromagnet in the original NES has been replaced by a NdFeB magnet array. Approximately 30% of the electron current was extracted using the magnet array. The remainder was lost to the ring while the electromagnet provided 90% extraction efficiency. A disk with a concentric hole has replaced the ring and the hole diameter was varied to improve extraction efficiency. The disk was separated from the cylinder to prevent shorting between them and sputtering of graphite on the insulator between the ring and the cylinder seen previously. Plasma potential, plasma density, electron temperature, and electron energies in the plume measurements as well as time resolved ICCD camera images of the plume will be discussed.

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