

Abstract Submitted  
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**Particle-In-Cell Simulations of a Thermionic Converter** STEPHEN

CLARK, None — Simulations of thermionic converters are presented where cesium is used as a work function reducing agent in a nano-fabricated triode configuration. The cathode and anode are spaced on the order of 100  $\mu\text{m}$ , and the grid structure has features on the micron scale near the anode. The hot side is operated near 1600 K, the cold side near 600 K, and the converter has the potential to convert heat to DC electrical current upwards of 20% efficiency. Affordable and robust thermionic converters have the potential to displace century old mechanical engines and turbines as a primary means of electrical power generation in the near future. High efficiency converters that operate at a small scale could be used to generate power locally and alleviate the need for large scale power transmission systems. Electron and negative cesium ion back emission from the anode are considered, as well as device longevity and fabrication feasibility.

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None

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