

Abstract Submitted
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Electron energy distribution functions modified by MacKenzie Maxwell Demons¹ NOAH HERSHKOWITZ, CHI-SHUNG YIP, University of Wisconsin - Madison — MacKenzie's "Maxwell Demon" is an array of positively biased thin wires mounted in a plasma. The original version² consisted of a 60cm x 60cm grid of 400 0.025mm diameter tungsten wires. Electrons accelerate radially towards the positively biased wires but only cold electrons with low angular momentum are collected. Removal of the cold electrons heats the plasma. Our experiments explore much smaller alternative demon geometries and their effects on argon and xenon plasmas in a multi-dipole plasma device. Using this device the electron temperature could be increased by factors of two or more. Effects on the plasma are compared to those obtained by applying a positive voltage to larger electrodes. At high positive voltage, a relaxation instability in the kHz range is induced which limits the application of this technique.

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²K. R. MacKenzie, R. J. Taylor, D. Cohn, E. Ault, and H. Ikezi, *App. Phys. Lett.* **18**, 529 (1971)

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