

Abstract Submitted
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Operation of a Multicell Trap¹ J.R. DANIELSON, N.C. HURST, C.J. BAKER, C.M. SURKO, University of California, San Diego — The multicell Penning-Malmberg trap has been proposed as a way to obtain high-capacity and/or portable antimatter traps.^{2,3} A new multicell test-structure is investigated, which has several off-axis cells as well as the capability of studying plasmas with kV space charge potentials. Experiments using test electron plasmas have demonstrated the injection of over 50% of the plasma into an off-axis trap, and the confinement of plasmas with 2×10^8 particles in an off-axis cell for hours using rotating electric fields. Other results to be discussed include the limits of the injection process, stacking plasmas in the off-axis cells, and comparing asymmetry-induced transport in off-axis and on-axis cells. Near-term goals include increasing off-axis injection efficiency, as well as the trapped particle number to $> 10^{10}$ in a single cell. These studies will test further the basic physics of the multicell concept and help refine the design a 21-cell trap for 10^{12} positrons.

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²Danielson, et. al., *Phys. Plasmas* **13**, 123502 (2006).

³Danielson, et al., AIP Conf. Proc. **1521**, 101 (2013).

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