

Abstract Submitted
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Development of a positron multicell trap.¹ J.R. DANIELSON, E.K. FRIIS, T.R. WEBER, C.M. SURKO, UCSD — There are numerous potential applications of high-capacity and/or portable antimatter traps. Previously, we proposed the design for a high-capacity, multicell Penning-Malmberg (PM) trap for positrons². Here, we discuss electron experiments designed to test the limits of confinement in a single PM cell. Specific issues include operation with potentials ≥ 1 kV and trapping and storage of 10^{10} particles at densities $\geq 10^{10}$ cm⁻³. We are also exploring methods for the dynamic manipulation and control of trapped plasmas, and methods to access off-magnetic-axis cells. The results of these studies will be used to finalize the design of a 95-cell trap for $N \geq 1 \times 10^{12}$ positrons. Possible extensions of this design, and expected limits on positron accumulation, will also be discussed.

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²C. M. Surko and R. G. Greaves, *Rad. Phys. and Chem.* **68**, 419 (2003); and *Phys. Plasmas* **11**, 2333 (2004)

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