

Abstract Submitted  
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**Construction of a Multicell Trap for Positron Storage**<sup>1</sup> J.R. DANIELSON, C.M. SURKO, University of California, San Diego — There are many potential applications of high-capacity and/or portable antimatter traps. We describe the construction (in progress) of a novel multicell Penning-Malmberg (PM) trap designed to store in excess of  $5 \times 10^{11}$  positrons.<sup>2</sup> The device will use 1 kV confinement potentials and consists of 21 PM cells in three banks of 7 cells. It is contained in a UHV vacuum system in a warm-bore magnet operating at 5 tesla. Each cell will have the capability to apply rotating electric fields to the plasma for increased radial confinement. A 40 cm long master cell will be used to move plasmas, received from a buffer-gas positron accumulator, across the magnetic field into off-axis cells using auto-resonant excitation of the diocotron instability.<sup>2</sup> Details of the design will be discussed and related to previous baseline experiments. Additional experiments with a test electrode structure will be conducted to minimize the diameter of the PM cells and to optimize confinement in off-axis cells in the less uniform portions of the magnetic field near the ends of the magnet. Anticipated uses of this device will be discussed.

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<sup>2</sup>J. R. Danielson, T. R. Weber, and C. M. Surko, *Phys. Plasmas* **13**, 123502 (2006).

James Danielson  
University of California, San Diego

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