

Abstract Submitted
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Design and Construction of a 21-cell Multicell Trap for Positron Storage¹ C.J. BAKER, J.R. DANIELSON, N.C. HURST, 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 up to 10^{12} positrons.^{2,3} The device consists of 21 PM cells (in three banks of 7 cells) within a UHV vacuum system and a 140 mm diameter warm-bore, 5 tesla, magnet. Each cell will use kV confinement potentials and have an azimuthally segmented electrode for diagnostics and plasma manipulation, such as the application of rotating electric fields. An independent, large-diameter master cell will be used to move plasmas, received from a buffer-gas positron accumulator, across the magnetic field to the off-axis cells using autoresonant diocotron-mode excitation.⁴ Details of the current design will be presented, as well as scenarios for effective extraction and use of the trapped particles.

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³Danielson, Hurst, Surko, AIP Conf. Proc. **1521**, 101 (2013).

⁴Fajans, Gilson, Friedland, *Phys. Rev. Lett.* **82**, 4444 (1999).

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