

Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Multicell Electrode Structure for Off-axis Plasma Confinement¹

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 anti-matter traps. One route towards this goal which we have been pursuing is the construction of a novel “multicell” trap architecture, with the goal of storage of $\geq 10^{12}$ positrons using kV confinement potentials. Plasmas will be stored in separate Penning-Malmberg traps (“cells”) arranged in parallel off the magnetic axis. This utilizes efficiently the magnetic field volume, while minimizing the required confinement voltages. Other enabling techniques will be discussed including the excitation of autoresonant diocotron modes to inject plasmas into the off-axis cells, as well as novel beams that can be created from this type of trapped plasma. New experiments testing the confinement in off-axis cells will be presented. Anticipated uses of this device, including an experiment to create an electron-positron plasma in a stellerator,² will also be discussed.

¹This work supported by DTRA.

²T. S. Pedersen, *et. al.*, *NJP* **14**, 035010 (2012).

James Danielson
University of California, San Diego

Date submitted: 16 Jul 2012

Electronic form version 1.4