

Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

A Proposed Apparatus for Efficiently Trapping and Cooling Positrons.¹ JASON ENGBRECHT, DANIEL ENDEAN, St. Olaf College — Previous work has shown the ability to trap positrons efficiently for long periods of times using a Penning trap. Utilizing strategically placed electrostatic wells, axial energy is transferred into cyclotron energy temporarily trapping the positrons. Combined with a ramping potential on one end of the trap, trapping times of a few ms with efficiencies of approximate 20% were achieved to produce a beam with a high energy spread (~ 100 eV). We have developed a simulation of this system for the purpose of studying its dynamics. From this simulation we have discovered the role of resonance between the cyclotron orbit and the length of the potential well. We have also examined the potential for a newly optimized trap based on this design that implements gas or electronic cooling to reduce the energy spread of the positrons.

¹This work was supported by NSF Grant PHY-0555631

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Date submitted: 02 Feb 2007

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