

**Abstract Submitted for the Thirty-second Annual Meeting  
Division of Plasma Physics  
November 12-16 1990**

Category Number and Subject 1.3 Nonneutral Plasmas

☐ Theory ☒ Experiment

Test Particle Confinement in a Non-neutral Plasma Trap,  
D.L. Eggleston, A. Garrison, and T. Reid, Occidental  
College -- Radial transport in cylindrical non-neutral  
plasma traps is thought to be dominated by particles  
satisfying the resonance condition  $kv - l\omega = 0$ , where  $v$  is  
the axial velocity,  $\omega$  is the azimuthal  $E \times B$  drift fre-  
quency, and  $k$  and  $l$  are the axial and azimuthal Fourier  
wavenumbers of any nonaxisymmetric fields. We are seek-  
ing to test this model by following the motion of test  
particles confined in such a trap. A small beam of  
electrons is injected off-axis and confined by negative  
end potentials. An azimuthal drift is produced by a  
negatively biased wire which runs along the axis of the  
device. Nonaxisymmetric fields are applied by appro-  
priately biasing the sectorized walls of the central con-  
finement region. Adjusting the bias of the beam, cen-  
tral wire, and wall sectors allows us to control  $v$ ,  $\omega$ ,  
and  $k$  and  $l$ , respectively. The position of the test  
electrons at a given time is obtained by dumping them  
onto a phosphor-coated quartz plate. The image produced  
is then digitized by a CCD camera/frame grabber system  
to allow for quantitative analysis of the data.

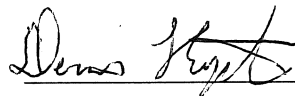
\*Supported by ONR N00014-89-J-1399.

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in the following grouping:  
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Submitted by:



(Signature of APS Member)

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This form, plus **TWO XEROX COPIES**, must be received by **NO LATER THAN NOON**, Thurs-  
day, July 12, 1990 at the following address:

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