Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Ac-driven, azimuthal density holes in non-neutral plasmas[1]
MICHAEL BORICH, Hebrew University of Jerusalem and Institute of Metal Physics, Ekaterinburg, Russian Federation, LAZAR FRIEDLAND, Hebrew University of Jerusalem — The formation and control of m - fold symmetric azimuthal density hole structures in a magnetized non-neutral plasma is studied within an adiabatic water bag theory. The holes are formed by subjecting initially uniform cylindrical plasma with a line density core to m - fold symmetric, azimuthal chirped frequency potential perturbations. The theory uses adiabatic invariants associated with the boundaries of the plasma and describes all stages of evolution in the driven system, i.e. the resonant passage through the boundary of the plasma column, the formation of density holes, and autoresonant dynamics of the driven density holes inside the plasma structure. The results of the theory are in a good agreement with PIC simulations. More complex, stable m - fold symmetric plasma structures with local minima in density distributions can be formed from other, initially axisymmetric distributions by external, chirped frequency drives.

[1]Supported by Israel Science Foundation grant No. 294/05.

Lazar Friedland
Hebrew University of Jerusalem

Date submitted: 15 Jul 2008 Electronic form version 1.4