Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Numerical modeling of the m = 1 diocotron mode in toroidal electron plasmas BAO HA, D.P. RYAN, S.K. CURRY, J.O. HECTOR, J.P. MARLER, M.R. STONEKING, Department of Physics, Lawrence University, Appleton, WI — A new toroidal electron plasma apparatus is coming online at Lawrence University: the Lawrence Nonneutral Torus II (LNT II). The primary means of diagnosing the plasma will be by way of measurements of image charge induced on sections of a gold-plated electrode. Numerical modeling methods are employed to solve Poisson's equation in toroidal geometry and determine image charge on the wall sections. The calculated electric field at the center of the plasma is used to determine the E x B drift velocity and consequently the trajectory of the plasma. We present numerical calculations of the signals arising from the m = 1 diocotron mode in toroidal geometry. The numerical model will be used to extract properties of the plasma from experimental data obtained in the LNT II device. In particular, the frequency of the m = 1 diocotron mode determines the total charge in the plasma while the mode amplitude and character yield information about the m = 1 motion of the plasma.

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Date submitted: 21 Jul 2006 Electronic form version 1.4