Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Electron Plasmas Cooled by Cyclotron-Cavity Resonance F. ROBICHEAUX, Purdue University, A.P. POVILUS, LLNL, N.D. DETAL, Beloit College, L.T. EVANS, University of California, Berkeley, N. EVETTS, University of British Columbia, J FAJANS, University of California, Berkeley, W.N. HARDY, University of British Columbia, E.D. HUNTER, University of California, Berkeley, L. MARTENS, University of British Columbia, S. SHANMAN, C. SO, University of California, Berkeley, X. WANG, Purdue University, J.S. WURTELE, University of California, Berkeley — We observe that high-Q electromagnetic cavity resonances increase the cyclotron cooling rate of pure electron plasmas held in a Penning-Malmberg trap when the electron cyclotron frequency, controlled by tuning the magnetic field, matches the frequency of standing wave modes in the cavity. For certain modes and trapping configurations, this can increase the cooling rate by factors of 10 or more. In this talk, we investigate the variation of the cooling rate and equilibrium plasma temperatures over a wide range of parameters, including the plasma density, plasma position, electron number, and magnetic field.

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Date submitted: 26 Jan 2017 Electronic form version 1.4