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Dynamic Control of Virtual Cathode for Improved IEC-POPS Operation[1] YONGHO KIM, HANS HERRMANN, GREG DALE, Los Alamos National Laboratory, KEENAN PEPPER, Florida State University — The widely known characteristic of inertial electrostatic confinement (IEC) is that high energies are easy to achieve, but reasonable densities are considerably more difficult. LANL has developed a density enhancement scheme, the Periodically Oscillating Plasma Sphere (POPS). A spherical ion cloud in a uniform electron background may undergo a self-similar collapse that can result in the periodic and simultaneous attainment of ultra-high densities and temperatures. Over the past three years, a great deal of experimental evidence for the POPS oscillation has been obtained [1]. However, abrupt virtual cathode decay is also observed when the potential well depth drops below a certain level. To improve IEC-POPS operation, the creation of stable, deep potential wells produced by virtual cathode is an essential element. To keep deep potential wells, we are in the process of upgrading the IEC-POPS device to ramp the electron emitter bias voltage. Influence of dynamic control of electron injection on the virtual cathode stability will be presented. [1] J. Park, R. A. Nebel, S. Stange, and S. Krupakar Murali, Physical Review Letters **95**, 015003 (2005).

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