

Abstract Submitted  
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**Diagnostics of an Electron Beam Integrated Thruster**<sup>1</sup> TSITSI MADZIWA-NUSSINOV, MAX LIGHT, PAT COLESTOCK, RON KASHUBA, RICK FAEHL, ISR-6, Los Alamos National Laboratory — Since the 1970s, Russian scientists have been utilizing Plasma cathode electron (PCE) sources for production of electron beams [1], [2]. We have utilized a PCE source in our Electron Beam Integrated Thruster (EBIT) experiment. Using an ECR source at 2.45GHz, we made our PCE source (described in detail in another presentation at this conference) by biasing a conducting plasma chamber to negative voltages up to -140V. We left a small aperture of 2cm in diameter through which an electron beam is extracted into a downstream Pyrex glass chamber with magnetic coils for plasma confinement. The plasma-electron beam system was diagnosed using three methods: a Langmuir probe (for electron temperatures, space potentials and electron densities), spectroscopy (for electron temperatures) and a retarded electron potential energy analyzer (for electron energies and space potentials). In this paper we will briefly describe our experiment, the PCE source, and give details of the diagnostics and our initial results on EBIT.

[1] Yu. E. Kreindel, *Plasma Cathode Electron Sources* ~Atomizdat, Moscow, 1977, p. 144.

[2] E. M. Oks, *Plasma Sources Sci. Technol.* **1**, 249 ~1992.

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