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Preliminary Characterization of an Iodine Plasma Source for use in Material Analysis[1] GEORGIA SHARP, JAMES ROGERS, RICHARD BRANAM, University of Alabama — Electric propulsion devices using xenon as a propellant are a high efficiency solution for large conventional satellites. The high storage density of iodine would enable these devices to require less mass for use in space technologies, if used as a propellant as an alternative to xenon. The ability to reduce the mass required for electric propulsion devices would not only reduce costs of space travel but also open up new opportunities for these devices to be used in smaller, more volume constrained missions. Iodine is a strong oxidizing agent. To determine if it is a viable alternative, the erosive properties must be quantified. The object of this research project was to characterize an iodine plasma source before using it for material exposure and analysis. A double Langmuir probe was used as the method of data acquisition for the plasma conditions. The plasma characterization identified the conditions in the plasma source that will be used to properly quantify the erosive properties in iodine plasma. Preliminary results indicate a maximum electron temperature of four electron volts, and a maximum plasma density of eight inverse cubic centimeters.

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