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Three-Dimensional Measurement of Electron Temperature and Density in a Split Ring Resonator Microplasma using Langmuir Probes[1] NEIL LAYA, ANDREW WALSTEN, GABE XU, University of Alabama in Huntsville — The Split Ring Resonator (SRR) is a micro-plasma generation device originally developed for use in the metamaterial field yet poses as a promising plasma source in ion thrusters. Research done previously has determined optimal design characteristics and the viability of the SRR in ion thrusters. So far, an SRR has been made and tested to find its optimal performance frequency. In order to further integrate the SRR into a miniature ion thruster, a three-dimensional analysis will be performed. This three-dimensional analysis will map both the plasma density and electron temperature of an argon micro plasma. The analysis will be performed using an asymmetric double Langmuir probe to find current-voltage curves at each individual point. To calculate plasma density and electron temperature, the Four Free Fitting Parameters method will be used to fit the data and the Druyvesteyn method to perform the calculations. Eventually, a three dimensional analysis will determine the optimal grid placement for a miniature ion thruster to be built.

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