Abstract Submitted
for the SES15 Meeting of
The American Physical Society

Characterization of the Diagnostics of the Inductively Heated Plasma Generator (IPG6-B)[1] JOSHUA EDGREN[2], Union Univ, KATHRYN CLEMENTS, Saint Louis University , MICHAEL DROPMANN[3], RENE LAUFER, TRUELL HYDE, LORIN MATTHEWS, Baylor University — The Inductively heated plasma generator (IPG6B) at the Center for Astrophysics, Space Physics, and Engineering Research (CASPER) at Baylor University provides valuable insight into the nature of high-enthalpy plasma flows in Helium, argon, and nitrogen. The device and its diagnostics have yet to be characterized. In order for the device to be useful for reentry simulations or for fusion reactor materials testing, a thorough map of its behavior at a wide range of pressures and gas flows were investigated. For this reason various experiments have been performed with a cavity calorimeter in order to determine the plasma power at distinct parameters. Although there is considerable work yet to do, the results have demonstrated trends in the devices behavior which will allow optimal operating conditions to be inferred. Additionally over the course of the analysis of these experiments, a Matlab algorithm was written to isolate stable regions of data and extrapolate equilibrium values and time constants from them. This quantifies the time required for experimental measurements to reach equilibrium after experimental parameters have been changed.

[1]Research conducted with funding from the national science foundation Grant No. PHY-1262031
[2]Research conducted at Baylor University's Center for Astrophysics, Space Physics, and Engineering Research.
[3]Research Adviser

Joshua Edgren
Union Univ

Date submitted: 30 Sep 2015 Electronic form version 1.4