Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Vacuum Ultraviolet and Visible Spectroscopy for Power Flow Studies on the 1 MA, 100 ns MAIZE LTD[1] TREVOR J. SMITH, P.C. CAMPBELL, NICHOLAS M. JORDAN, R.D. MCBRIDE, University of Michigan, M.R. GOMEZ, M.D. JOHNSTON, G.R. LAITY, Sandia National Laboratories — Power flow studies on the 25-MA Z-Machine at Sandia have shown that magnetically insulated electron flow can separate from the vicinity of cathode surfaces, cross the anode-cathode gap, and lead to a loss of current delivered to the load. This presentation reports on efforts to develop spectroscopic diagnostics for power flow experiments on the Michigans 1-MA MAIZE facility to validate ongoing simulation studies. A vacuum ultraviolet (VUV) spectrometer will be used to measure the rate at which neutral constituents desorb out of the magnetically insulated transmission lines in experiments run with scaled anode-cathode gap spacing to obtain electric field intensities or current densities comparable to those found in certain regions on Z. The VUV region of the spectrum (100-200 nm) was chosen due to the expectation of low levels of background black-body emission, supported by preliminary simulations with PrismSPECT. Visible spectroscopy on MAIZE will allow comparison between VUV data on MAIZE and published visible spectroscopic data on the Z-machine.

[1]Work supported by Sandia National Labs through the Campus Executives and the LDRD Programs, Project 20-9240. Sandia is a multi-mission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC., a wholly owned subsidiary of Honeywell International, Inc., for the U.S. DOEs NNSA under contract DE-NA-0003525.

Trevor Smith
University of Michigan

Date submitted: 03 Jul 2019 Electronic form version 1.4