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3P86 - Vacuum Ultraviolet Spectroscopy for Power Flow Studies on the 1 MA, 100 ns MAIZE LTD

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The University of Michigan is partnered with Sandia National Laboratories in order to experimentally verify power flow simulations in the anode-cathode gap on Z-machine. Due to the ionization of desorbed neutral constituents of the insulated transmission lines, the electron current flow can become unconfined to the electrode surface and travel across the anode-cathode gap. This flashover of plasma is a limiting factor for the total current to the load. We are building a vacuum ultraviolet spectrometer to characterize desorption rates of the constituents from the insulated transmission lines as a function of heating rate and electromagnetic field strength for use on the 1-MA, 100 ns MAIZE LTD at the University of Michigan. The vacuum ultraviolet region of the spectrum was chosen due to the low intensity black-body radiation in the 100-200 nm band gap, allowing for high resolution measurements. We hope to use this setup as a diagnostic for a series of experiments using scaled current and anode-cathode gap spacing in the future.

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