

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Extending Experimental and Diagnostics Capabilities on the 1-MA, 100-ns MAIZE Pulsed Power Facility¹ AKASH SHAH, PAUL CAMPBELL, NICHOLAS JORDAN , RYAN MCBRIDE, University of Michigan — The Z-machine is instrumental in plasma physics research across a range of applications. University-scale z-pinch experiments, such as gas-puff z-pinches, can inform the high-value experiments conducted at Sandia. A gas puff z-pinch requires gas to be puffed into the region between two electrodes, which is then pulsed with a high voltage. The gas is ionized, accelerated, and compressed as the current flows across the electrodes, allowing for study of pinch phenomena including fusion reactions. Fusion is largely the result of micro-pinch instabilities, which are regions of extreme pressures and temperatures within the plasma and are poorly understood. We report on the progress made in developing this system for MAIZE. Additionally, we have revamped switch diagnostics on MAIZE, which consists of a set of 40 capacitor-switch-capacitor bricks. Discharging these capacitors is carried out by the breakdown of the switch, resulting in emission of light. Monitoring this light provides information on switch performance. A circuit can be set up that reduces a PMT to a binary digit and six PMTs can then uniquely identify a single pre-firing switch out of 40. Lastly, we report on the development of an LT Spice model for the charging and discharging of the entire MAIZE facility.

¹Work supported by a seed grant from the Michigan Memorial Phoenix Project and the NNSA Stewardship Sciences Academic Program under DOE Cooperative Agreement DE-NA0003764

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Date submitted: 02 Jul 2019

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