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Development of a Gas-Puff Z-Pinch Neutron Source for the 1-MA, 100-ns MAIZE LTD[1] AKASH SHAH, MARY BOSSARD, GRANT YOUNG, NICHOLAS JORDAN, RYAN MCBRIDE, University of Michigan, KRISTI ELLIOTT, MAHADEVAN KRISHNAN, Alameda Applied Sciences Corporation — The Z-machine at Sandia National Laboratories 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 on the Z facility. A gas-puff z-pinch requires gas to be puffed into the anode-cathode gap, 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. The initial ionization condition of the gas-puff prior to compression is poorly understood. Additionally, how this affects fusion, which is largely the result of micro-pinch instabilities, is also poorly understood. We report on the progress made in developing this experimental capability for the 1-MA, 100-ns MAIZE Linear Transformer Driver at the University of Michigan. Specifically, we discuss the construction and integration of the fast-valve and nozzle assembly, valve drivers, gas manifold, MAIZE transmission lines, and pre-ionization generator.

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