Development of a Gas-Puff Z-Pinch Experiment for the 1-MA, 100-ns MAIZE Linear Transformer Driver*

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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 [1]. The gas is ionized, accelerated, and compressed as the current flows across the electrodes, allowing for study of pinch phenomena including fusion reactions [2]. 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 preliminary results from the newly developed experimental capability on the MAIZE Linear Transformer Driver at the University of Michigan

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References

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