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Modified Cathode Design for the ZaP Flow Z-Pinch Experiment
S.D. KNECHT, U. SHUMLAK, B.A. NELSON, R.P. GOLINGO, K.A. MUNSON, C.S. ADAMS, University of Washington — The purpose of the ZaP Flow Z-Pinch Experiment at the University of Washington is to investigate the stabilizing effects of sheared flows on gross plasma stability. The inner electrode (cathode) of the ZaP experiment has been redesigned and replaced by a larger diameter version. The previous cathode had an outer diameter of 10 cm and a single neutral-gas puff valve in its interior along with eight azimuthally-spaced valves from the outer electrode, while the modified cathode has an outer diameter of slightly greater than 15 cm, which allows for the installation of nine neutral-gas puff valves in its interior. This greater number of valves, along with the addition of a vacuum bypass system, will allow the ZaP experiment a greater quantity and better control of gas injection. It is expected that this will increase the length of the stable (quiescent) period, while the larger diameter will result in a greater degree of adiabatic compression that will significantly increase the temperature and density of the pinch. Temperature and density measurements will be measured with a Thomson scattering system. Results for hydrogen and xenon pinches, along with some theoretical treatment, are included here.

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