Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Initial results of Fusion Z-Pinch Experiment, FuZE, and magnetic field topology analysis through data driven modeling[1] E.L. CLAVEAU, U. SHUMLAK, R.P. GOLINGO, B.A. NELSON, T.R. WEBER, University of Washington, H. MCLEAN, Lawrence Livermore National Laboratory — The FuZE project is a sheared flow stabilized (SFS) Z-pinch experiment that investigates scaling the SFS Z-pinch to fusion conditions. FuZE will generate a 1 mm radius Z-pinch with a 300 kA plasma current. An array of 94 surface-mounted magnetic field probes that are embedded in the outer copper electrode provide the primary measure of the time-dependent magnetic topology of the pinch plasma. Azimuthal field measurement provide instantaneous information about the magnitude and position of the plasma current. The initial results obtained in the form of magnetic field topology are compared to previous ZaP experimental results, an experiment that investigated shear flow stabilization of Z-pinch at lower current. The magnetic field topology evolution is investigated through data-driven modeling of the characteristic dynamics. The modeling provides time evolution of large-scale structures and dynamics quantified over multiple plasma pulses. These properties can give insight about spatial and temporal propagation of fluctuations to better characterize the plasma evolution.

[1]This work funded by the USDOE/ARPAe Alpha Program.

E.L. Claveau
University of Washington

Date submitted: 15 Jul 2016 Electronic form version 1.4