

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Design of the Fusion Z-Pinch Experiment - FuZE¹ U. SHUMLAK, Univ of Washington, H.S. MCLEAN, Lawrence Livermore National Lab, B.A. NELSON, R.P. GOLINGO, Univ of Washington, A. SCHMIDT, Lawrence Livermore National Lab, E.L. CLAVEAU, Univ of Washington — Based on the successful results of the sheared flow stabilized (SFS) Z-pinch from ZaP and ZaP-HD, a new experiment FuZE is designed to scale the plasma performance to fusion conditions. The SFS Z-pinch is immune to the instabilities that plague the conventional Z-pinch yet maintains the same favorable radial scaling. The plasma density and temperature increase rapidly with decreasing plasma radius, which naturally leads to a compact configuration at fusion conditions. The SFS Z-pinch is being investigated as a novel approach to a compact fusion device in a new collaborative ARPA-E ALPHA project with the University of Washington and Lawrence Livermore National Laboratory. The project includes an experimental effort coupled with high-fidelity physics modeling using kinetic and fluid simulations. Along with scaling law analysis, computational and experimental results that have informed the design and development of the FuZE apparatus are presented.

¹This work is supported by an award from US ARPA-E.

Uri Shumlak
Univ of Washington

Date submitted: 24 Jul 2015

Electronic form version 1.4