Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

**Reduction of Blob-Filament Radial Propagation by Parallel Variation of Flow Speeds**[1] J.R. MYRA, Lodestar, S.-H. KU, PPPL, D.A. RUSSELL, Lodestar, J. CHENG, U. Colorado, I. KERAMIDAS CHARIDAKOS, LANL, S.E. PARKER, U. Colorado, R.M. CHURCHILL, C.S. CHANG, PPPL — Data from an XGC1 gyrokinetic simulation is analyzed to understand the three-dimensional spatial structure and the radial propagation of blob-filaments generated by quasi-steady turbulence in the tokamak edge pedestal and scrape-off layer plasma. Spontaneous toroidal flow speeds vary in the poloidal direction and shear the filaments within a flux surface resulting in a structure that varies in the parallel direction. This parallel structure allows the curvature and grad-B induced polarization charge density to be shorted out via parallel electron motion. As a result, it is found that the blob-filament radial velocity is significantly reduced from estimates which neglect parallel electron kinetics, broadly consistent with experimental observations. Conditions for when this charge shorting effect tends to dominate blob dynamics are derived and compared with the simulation.

[1]Work supported by the U.S. Department of Energy Award Number DE-AC02-09CH11466 sub-contract SO15882-C.

James Myra
Lodestar Res Corp

Date submitted: 25 Jun 2020 Electronic form version 1.4