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Simulation of plasma sheath turbulence for magneto-inertial fusion (MIF)[1] NATALIA KRASHENINNIKOVA, XIANZHU TANG, VADIM ROYTERSHTEYN, WILLIAM DAUGHTON, LANL — A leading approach to achieve MIF is to use an imploding metal liner to compress magnetized target plasma to thermonuclear temperatures. For MIF applications, the magnetic field is parallel to the liner surface, which causes the ions, with their large gyro-radii, to positively charge the liner. This creates a strong ExB shear flow which can cause turbulence and regulate. Here we report on progress of the simulation studies of plasma sheath turbulence using a state-of-the-art VPIC [1] code. Baseline calculations are carried out examine the possibility of establishing a quiescent sheath plasma equilibrium in 1D for a flat liner surface and 2D for the shaped one, which should be unstable when 2D and 3D dynamics are allowed. The details of plasma sheath parameters from these runs, allows us to examine the regimes of various instabilities and their nonlinear saturation.

[1] K. J. Bowers, et al., "Ultra high performance 3D electromagnetic relativistic kinetic plasma simulation," Phys. Plasmas 15, 055703 (2008).

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