Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Electron density fluctuation reconstruction for 2D beam emission spectroscopy plasma edge and SOL measurements MATE LAMPERT, AHMED DIALLO, Princeton Plasma Physics Laboratory, SANDOR ZOLETNIK, MTA Wigner RCP, Hungary — SOL and edge plasma turbulence contributes significantly to the radial particle losses of the plasma, thus, tampering the confinement. Furthermore, the radially moving density filaments could cause high erosion on the wall. These rise great interest to analyze the scrape-off layer turbulence in detail. It has been demonstrated, that beam emission spectroscopy is a capable diagnostic for measuring turbulence in both SOL and edge plasmas. However, due to the finite lifetime of the excitation states during the beam - plasma interaction, and the optics, spatial smearing is introduced to the measurement. This unwanted feature hinders the detailed analysis of SOL turbulence, which would quantify the size of the intermittent events ultimately leading to analysis of the expected particle flux of the SOL turbulence. A numerical method was developed to overcome this unwanted effect, which can deconvolute the spatial smearing by minimizing the undulation of the fluctuations calculated from realistic fluctuation - response transfer functions. By applying the numerical reconstruction on Deuterium BES data, it is demonstrated, that this method can successfully retrieve the local electron density fluctuations.

Mate Lampert
Princeton Plasma Physics Laboratory

Date submitted: 10 Jul 2019 Electronic form version 1.4