Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Experimental observations of 3D neon transport following shattered pellet injection in Super H-modes[1] R. SWEENEY, MIT-ORISE, R. RAMAN, U. Washington, N. EIDIETIS, GA, R. GRANETZ, MIT, J. HERFINDAL, ORNL, E. HOLLMANN, UCSD, M. LEHNEN, ITER, R. MOYER, UCSD, D. SHIRAKI, ORNL, DIII-D TEAM — Stable DIII-D Super H-modes with 1.8 MJ thermal energies are terminated by a shattered neon pellet to study radiation asymmetries during mitigated disruptions. Asymmetric neon distributions cause radiation peaking that might melt ITER components [Lehnen NF **55** (2015) 123027]. Ne-I images of the injection show field-aligned and cross-field structures, and penetration to the $q = 2$ surface before the thermal quench (TQ). Near the injection in the co-rotation direction, an Absolute eXtreme UltraViolet fan array (AXUV-1) also exhibits signs of cross-field transport. Approximately twice the distance in the counter-rotation direction, AXUV-2 and interferometry measurements corroborate a 0.5-1 ms delay in the arrival of neon ions relative to AXUV-1, indicating a peaked Ne distribution during this time. When the Ne reaches AXUV-2, the Ne distribution is helical, and this helical structure is evident throughout the TQ. Interferometry further supports this helical structure and reveals strong inboard-to-outboard density asymmetries. Parallel diffusion does not appear suitable to explain these observations, so parallel convection models are under investigation, and implications for radiation peaking in ITER will be discussed.

[1]Work supported by US DOE under DE-SC0014664, DE-SC0006757, DE-AC05-00OR22725, DE-FG02-07ER54917, and DE-FC02-04ER54698.

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Date submitted: 03 Jul 2019 Electronic form version 1.4