Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

High energy super-H plasmas mitigated with single and dual Shattered Pellet Injection[1] J. L. HERFINDAL, D. SHIRAKI, L. R. BARYLOR, Oak Ridge National Lab, I. BYKOV, E. M. HOLLMANN, University of California San Diego, R. A. MOYER, Retired, N. W. EIDIETIS, General Atomics —
Mitigation of high-energy super-H mode disruptions in DIII-D through Shattered Pellet Injection (SPI) may result in multiple radiation flashes, depending on pellet composition. The experiment used pellets of varying size and composition (changing Ne/D2 ratio) to examine effects that excess D2 may have on the mitigation. The majority of shutdowns with pellets composed of both Ne and D2 resulted in two radiation flashes – one when the pellet hits the edge and another when the core thermal energy drops at the end of the thermal quench. Mitigation of super-H mode plasma disruptions using pellets composed only of pure Ne follow an outside-in mitigation with a single radiation flash, similar to typical DIII-D H-mode SPI mitigated discharges. Additional experiments using multiple shattered pellets at different toroidal locations show an increase in current quench duration for H and super-H mode discharges compared to single pellet injection with similar Ne and D2 quantities. A comparison of pre-thermal quench radiation profiles due to high-Z impurity injection by SPI and dual SPI into H and super H-mode plasmas will be presented.

[1]Supported by the US DOE under DE-AC05-00OR22725, DE-FG02-07ER54917, and DE-FC02-04ER54698.

Jeffrey Herfindal
Oak Ridge National Lab

Date submitted: 29 Jun 2020 Electronic form version 1.4