Abstract Submitted
for the DPP01 Meeting of
The American Physical Society

Sorting Category: (Experimental)

Modeling of Neon and Argon Dynamics During ELMs in DIII-D J. Hogan, L. Baylor, R. Colchin, M. Wade *Oak Ridge National Laboratory* — Type I ELMs can provide beneficial core impurity regulation during injection of noble gas impurities to reduce the peak divertor heat flux. Since the quantitative relation between ELM heat flux spikes and impurity expulsion efficiency is poorly known, we analyze transient recycling during Type I ELMs in upper single null configurations, for which fast spectroscopic measurements (f ~1 kHZ) of Nel and D_α emission have been made. Double null configurations with D pellet and Ne gas injection are also analyzed, to explore the recycling impurity response. Observations of stepwise core neon accumulation resulting from discrete ELM events, even in the absence of neon injection, are used to calibrate a detailed neon recycling model. Finally, the effect on neon and argon enrichment values of neutral charge exchange processes during the ELM deuterium flux pulses is compared with dependence on local deuterium puffing ('puff and pump' effect) in lower single null configurations. A detailed MIST ELM-event impurity recycling model, the "b2.5" code, and the b2-Eirene code (IPP-Garching) are used.

*Supported by US DOE Fusion Contract DE-AC05-00OR22725.

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Date submitted: Electronic form version 1.4