Abstract Submitted
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Modeling of Balmer series deuterium spectra with the Cretin code for diagnosing the inner divertor re-attachment threshold in NSTX discharges with lithium coatings[1] F. SCOTTI, Princeton University, V.A. SOUKHANOVSKII, H.A. SCOTT, LLNL — Application of evaporated lithium coatings on graphite divertor tiles in NSTX led to a reduction of divertor recycling. The inner divertor electron density and recombination rate were also drastically reduced, suggesting that the normally detached inner divertor re-attached in many lithium-assisted ELM-free H-mode discharges. This observation was based on the divertor brightness profiles of Stark-broadened ultraviolet spectral lines from the Balmer series $n = 2 - 7...12$ transitions. To understand the divertor transport regimes with reduced recycling and the density thresholds for both the inner divertor detachment and X-point MARFE formation, we are developing a simulation of the NSTX divertor spectra in a realistic viewing geometry using the Cretin code. The non-local thermodynamic equilibrium radiation transport code Cretin uses a 1-D plasma model with neutral diffusion and line shape calculations based on the quasi-static ion microfield approximation and a binary electron impact collision model.

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Filippo Scotti
Princeton University

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