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UEDGE Simulations of the NSTX Liquid Lithium Divertor Module[1] D.P. STOTLER, PPPL, R. MAINGI, ORNL, A.YU. PIGAROV, UCSD, M.E. RENSINK, T.D. ROGNLIEN, LLNL — The Liquid Lithium Divertor (LLD) module planned for installation in the lower divertor of NSTX will provide a nearly toroidally continuous liquid lithium surface in close proximity to the plasma. The objective of the module is to pump enough deuterium to allow full control of the plasma density thereby permitting high performance H-modes to be held in near steady state and increasing the fraction of non-inductively driven current. A series of UEDGE simulations has been carried out to aid in the determination of the optimal location, which may be inboard or outboard of the CHI insulating break, as well as the width of the LLD. UEDGE's transport coefficients and boundary conditions have been adjusted to match an existing NSTX discharge intended as a prototype of the high performance H-mode experiments planned for the LLD. The effect of the LLD has been incorporated into UEDGE as a reduction in the recycling coefficient over a section of the divertor. With the plasma flux coming of the core held fixed, the liquid lithium's particle absorption results in a reduction in the simulation's plasma density at the core boundary. The primary output of this study is then the variation of this density reduction with the major radius and width of the LLD.

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