

Abstract Submitted
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Numerical Investigation of the Generalized Plasma Density Diffusion Equation in the Edge Pedestal¹ J.-P. FLOYD, W.M. STACEY, Georgia Tech — Momentum balance constraints require that the radial particle flux in the plasma edge satisfies a pinch-diffusion relation, which leads upon substitution into the continuity equation to generalized diffusion equations which also contain temperature gradients, a pinch velocity determined primarily by the electromagnetic forces, and a generalization of the diffusion coefficient. Since both the temperature gradients and the pinch velocities vary rapidly with radius in H-mode tokamak edge plasmas, it is of interest to investigate the numerical solution of such equations in order to gain insight as to whether such generalization of the diffusion equation formalism can be incorporated into large plasma edge codes such as UEDGE and SOLPS. Numerical studies indicate that direct solution of the coupled continuity and pinch-diffusion equations is more accurate than solution of the generalized diffusion equation that results from combining the two.

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