Abstract Submitted
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Measurement and Modeling of Fast Electrons with Lower Hybrid in MST D.R. BURKE, A.F. ALMAGRI, J.K. ANDERSON, D.J. CLAYTON, C.B. FOREST, J.A. GOETZ, M.C. KAUFMAN, UW - Madison, R.W. HARVEY, CompX — Lower hybrid wave injection experiments are underway on the MST RFP, driving current at r/a ~ 0.75 in order to stabilize tearing fluctuations. Predicting the effects of LH deposition requires a detailed understanding of the fast electron population. CQL3D, a Fokker-Planck code, has been used to study this population. X-ray emission has been accurately predicted in reduced-tearing, improved confinement discharges. It has however proved challenging to model standard RFP discharges, where CQL3D is shown to over-predict x-ray emission. Attempts to reconcile the code and experiment are presented. A tungsten target probe has been used to stimulate bremsstrahlung emission during standard discharges with LH. Measurements indicate radially localized fast electrons associated with LH starting at an insertion depth of 3 cm ($r/a \sim 0.94$). X-ray flux is observed to increase into $r/a \sim 0.9$, the limit of probe insertion for high current plasmas. CQL3D can also be used to determine the efficiency of LH absorption in various plasma conditions. Studies indicate that Rechester-Rosenbluth diffusion prevents the efficient accumulation of LH current in highly stochastic plasmas. In addition to these results, estimates of the power required to maintain the current in stabilized plasmas will be presented. Work supported by US DOE.

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