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Investigation of EBW Coupling and Propagation in H-Mode Plasmas in NSTX[1] S.J. DIEM, G. TAYLOR, P.C. EFTHIMION, H. KUGEL, B.P. LEBLANC, C.K. PHILLIPS, PPPL, J.B. CAUGHMAN, J.B. WILGEN, ORNL, J. PREINHAELTER, J. URBAN, Czech Institute of Plasma Physics, S.A. SABBAGH, Columbia University — EBW emission (EBE) diagnostics and EBE modeling have been employed on NSTX to study oblique EBW to O-mode (B-X-O) coupling and propagation. Initial EBE measurements in H-mode plasmas exhibited strong emission before the L-H transition, but the emission rapidly decayed after the transition. EBE simulations show that EBW collisional damping prior to mode conversion (MC) can significantly reduce the measured EBE when $T_e < 30$ eV, explaining the observations. Lithium evaporation was used to significantly reduce EBW collisional damping near the MC layer. The lithium evaporation rate was increased from 0 to 19 mg/min to reduce n_e and increase T_e outside the LCFS in an H-mode plasma. With edge conditioning, an increase in T_e near the fundamental MC layer from 10 eV (no Li) to > 20 eV (with Li) was observed. As a result the measured B-X-O transmission efficiency increased from $< 10\%$ (no Li) to 60% (with Li), consistent with EBE simulations.

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