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Changes in Impurity Transport with Applied Torque in DIII-D ELMy H-mode Plasmas[1] K. E. THOME, C. CHRYSTAL, C.C. PETTY, General Atomics, T. ODSTRCIL, T.M. WILKS, MIT-PSFC, E. HOLLMANN, UCSD, G.R. MCKEE, UW-Madison, B.S. VICTOR, LLNL — Impurity transport is studied in low torque ITER relevant plasmas by varying the injected torque and plasma rotation via neutral beam injection at fixed input beam and electron cyclotron (EC) power, while other plasma parameters are held nearly constant. Trace amounts of aluminum and tungsten are injected with a laser blow-off system at three injected torque levels: 3, 1.5, and $\sim$ 0 N-m. As the core toroidal rotation decreased by 5x over this scan, the core ion temperature decreased by 25%. EC power is applied to study the effect of EC location on impurity transport. The W impurity confinement time of the 3 N-m plasmas is $\sim$ 400 ms and it increased to $\sim$ 750 ms at $\sim$ 0 N-m; the core Z_{eff} also increased from 1.9 to 2.7. Similarly, the confinement time for Al increased from 200 to 400 ms over the same torque range. Preliminary analysis indicates Al core transport coefficients are nearly the same at low and high torque, the increase in impurity confinement times and Z_{eff} are likely due to a drop in ELM frequency. Understanding the relationship between rotation, ELM frequency, EC heating, and impurity mass has important implications for ITER and will be further investigated via impurity transport modeling and experimental turbulence measurements.

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