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Momentum Confinement on DIII-D with Low Net Neutral Beam Torque[1] W.M. SOLOMON, R.V. BUDNY, D. MIKKELSEN, R. NAZIKIAN, S.D. SCOTT, M.C. ZARNSTORFF, PPPL, K.H. BURRELL, J.S. DEGRASSIE, R.J. GROEBNER, J.E. KINSEY, C.C. PETTY, GA — Momentum confinement was investigated in ELMing H-mode plasmas with elevated q_{min}. Torque scans were performed at constant β_N, and the rotation profile was measured using charge exchange recombination (CER) spectroscopy. Studies of the mechanical angular momentum in the plasma show a non-uniform response to the applied neutral beam torque, resulting in a torque dependence of the momentum confinement time. Under nominally balanced neutral beam injection, the plasma maintains a significant rotation in the same direction as the plasma current (co-rotation). The intrinsic rotation can be understood as being due to an offset in the applied torque (i.e. an "anomalous torque"). Analysis including the effect of anomalous fast ion diffusion shows that the anomalous torque appears to have a magnitude comparable to one neutral beam source, with the torque peaked at the edge of the plasma. Meaningful studies of momentum confinement must account for this intrinsic rotation/anomalous torque.

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W.M. Solomon
Princeton Plasma Physics Laboratory

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