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Category Number and Subject: 5.6.2 DIII-D Tokamak

Theory Experiment

Rotation in DIII-D Without Auxiliary Momentum Input,*

J.S. deGrassie, K.H. Burrell, J. Lohr, *General Atomics*, L.R. Baylor, *ORNL*, W.M. Solomon, *PPPL*, and the DIII-D National Team – Detailed velocity profile measurements in DIII-D measure toroidal rotation with only nonperturbative auxiliary momentum input due to very short neutral beam blips, used for the charge exchange recombination emission measurements of carbon and other nonhydrogenic ions. Ohmic, Ohmic H-mode and electron cyclotron heated (ECH) H-mode discharges exhibit toroidal rotation well above the diamagnetic drift velocity in magnitude. A general feature of the discharges investigated to date is co-rotation ($\parallel I_p$) in roughly the outer half of the minor radius. For Ohmic H-modes, this co-directed rotation exists across the minor radius, while for ECH H-modes there is a reduction of the co-rotation in the core, with many cases showing reversal to counter-rotation in the core. The profile details of this reversal, or reduction, do not appear strongly correlated with the ECH power deposition profile. Ohmic discharges in some instances also have suppressed or reversed core rotation. The DIII-D diagnostic system allows detailed measurement of toroidal rotation at the plasma edge, important to establish the boundary condition. The profile details and computed electric fields will be described and compared

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