Abstract Submitted
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Toroidal and Poloidal Rotation of Deuterium Ions in DIII-D Intrinsic Rotation Conditions[1] B.A. GRIERSON, W.M. SOLOMON, Princeton Plasma Physics Laboratory, K.H. BURRELL, J.S. DEGRASSIE, General Atomics, J.A. BOEDO, UCSD — Comparisons of the bulk deuterium ion toroidal rotation to neoclassical theory reveal a significant discrepancy. The source of this discrepancy lies in the prediction of the main-ion poloidal rotation. In low toroidal rotation plasmas, E_r is dominated by the pressure and poloidal rotation contributions; hence, an accurate determination of the poloidal flow is required in these conditions. We infer the main-ion poloidal rotation from measured main-ion toroidal rotation and the radial force balance relation. Inferred main-ion poloidal flow is significantly larger in the ion diamagnetic direction than NCLASS predictions. By experimentally performing scans of the plasma current, toroidal field and heating mix, the dependence of main-ion toroidal and poloidal rotation on these parameters can be understood. Comparisons of main-ion charge exchange recombination measurements of rotation with Mach probe data and several neoclassical rotation models will be performed.

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