

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

New Charge Exchange Recombination Spectroscopy Measurements of DIII-D Poloidal Rotation with PAAR and High Field Side Plasma Density¹ COLIN CHRYSTAL, General Atomics, SHAUN HASKEY, PPPL, KEITH BURRELL, General Atomics, BRIAN GRIERSON, PPPL, CAMI COLLINS, General Atomics — New sightlines have been installed on the high-field side of the DIII-D tokamak on the charge exchange recombination spectroscopy (CER) diagnostic for the 2019 campaign. Sightlines are toroidal and connected to detectors for simultaneous measurements of impurity (carbon) and main (deuterium) ions. In combination with corresponding measurements on the low-field side, new measurements of impurity density asymmetry and poloidal rotation of impurity and main ions can be made. These new measurements are available in the core from the magnetic axis to normalized minor radius of ~ 0.6 for typical plasma shapes. The beam neutral density used to determine the impurity density asymmetry is derived from measurements of beam neutral emission on the high- and low-field side. This approach avoids systematic errors that could arise from the use of a beam stopping calculation. The poloidal rotation measurements use the poloidal asymmetry in angular rotation (PAAR) method to avoid complications due to the gyro-orbit cross section effect. This method is particularly useful for the main-ions which resist direct measurement of poloidal rotation because beam neutral emission Doppler shift is low for a vertical view, causing it to overlap the charge exchange emission.

¹Work supported by US DOE under DE-FC02-04ER54698, DE-AC02-09CH11466

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Date submitted: 28 Jun 2019

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