Abstract Submitted
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**Determining the Radial Electric Field in HSX Using Impurity Ion Velocity Measurements from CHERS**[1] A. BRIESEMEISTER, K. ZHAI, D.T. ANDERSON, F.S.B. ANDERSON, J. LORE, J.N. TALMADGE, HSX Plasma Laboratory, University of Wisconsin, Madison — A Charge Exchange Recombination Spectroscopy (CHERS) system is used to measure the velocity, density, and temperature of fully stripped carbon impurities in the Helically Symmetric Experiment (HSX), a quasi-helically symmetric stellarator. Velocity measurements are obtained by reversing the magnetic field between sets of shots in order to reverse the plasma flow velocity. This doubles the distance the measured photons are Doppler shifted and eliminates the need to accurately determine the value of the unshifted emission line which can depend on plasma conditions. Since two viewing angles (one approximately poloidal and the other approximately toroidal) are used at each radial location, the velocity magnitude and direction can be determined. The measured velocity is used to determine the radial electric field from force balance. A comparison of the measured values to those calculated using a momentum-conserving neoclassical transport model will be presented.

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