

Characterization of Cross-Section Correction to Charge Exchange Recombination Spectroscopy Measurements Using Co+Counter Neutral Beam Views*

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Measurements of rotation using charge exchange recombination (CER) spectroscopy can be affected by the energy dependence of the charge exchange cross-section. On DIII-D, the associated correction to the rotation can exceed 100 km/s at high temperatures. In reactor relevant low rotation conditions, the correction can be several times larger than the actual plasma rotation and therefore must be carefully validated. New chords have been added to the DIII-D CER diagnostic to view the counter neutral beam (NB) line. The addition of these views allows experimental characterization of the correction, which acts in the opposite directions for co versus counter NBs. A database of rotation comparisons from the two views will be presented, showing that the calculated cross-section correction can adequately describe the measurements, although there is some indication of possible “over-correction” under some conditions.

*This work supported by the U.S. Department of Energy under DE-AC02-76CH03073 and DE-FC02-04ER54698.