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☐ Theory ☒ Experiment

The Effects of Non-axisymmetric Fields on Divertor Conditions in the DIII-D Tokamak,* A.R. Briesemeister, R.C. Isler, J.-W. Ahn, E.A. Unterberg, D.L. Hillis, *ORNL*; A.G. McLean, *LLNL* – Measurements of impurity ion density, temperature and flow velocity made using the multichord divertor spectrometer (MDS) on DIII-D are presented for plasmas both with and without externally applied resonant magnetic perturbations (RMPs). Large parallel flows, measured to be on the order of 25 km/s, are driven by the Bohm sheath criteria at the plasma/wall interface. Changes in the connection lengths of the magnetic field, which can cause changes in the ion flow in the divertor, are predicted to occur when the RMPs are applied. Measurements of both C II and C III are analyzed to assess changes in both the flow and the spatial localization of the different carbon ionization states when RMPs are applied. In high-density plasmas, where RMPs had no effect on the core plasma conditions, no measurable changes were seen in the carbon flow in the divertor. Flows measured in lower density conditions will be used to investigate the relationship between density and the effects of RMPs on divertor plasmas.

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