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The Effect of SOL Flow on Core Impurity Content in DIII–D[1] G.D. PORTER, N. WOLF, M.E. FENSTERMACHER, Lawrence Livermore National Laboratory, J. BOEDO, UCSD, R.C. ISLER, ORNL, DIII–D TEAM, General Atomics — A well designed divertor in a high power tokamak must control the flow of impurities to closed field lines. Core impurities arise from sources in the scrape-off layer (SOL), and the efficiency by which they are transported to the closed lines is determined by parallel and radial transport in the SOL. Analysis with the 2-D fluid code UEDGE indicates the dominate forces for parallel transport are the $\nabla T_{\rm i}$ force and drag force from flowing hydrogenic plasma in the DIII–D tokamak. We find the impurity density peaks at poloidal positions defined by a null in the net parallel force. The core is then fueled by radial diffusion from these density peaks. We report the details of this analysis, together with the relevance to the question of the core impurity content in this paper. The efficacy of the UEDGE results is discussed by comparison with direct experimental measurment of the parallel flow of both the intrinsic carbon impurity species, and the primary ions. We will also describe the status of our analysis of the effect of $\nabla \vec{B}$ and $\vec{E} \times \vec{B}$ drifts on the flow patterns in the SOL.

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[X] Prefer Oral Session
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Special instructions: DIII–D Oral Session II, immediately following Boedo

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