Abstract Submitted
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Divertor ExB and Parallel Flows on the DIII-D Tokamak*[1]

J BOEDO, D RUDAKOV, UCSD — E×B convection is an important particle transport mechanism responsible for up to ∼50% of the total particle flux into the divertor, changing direction with B, and playing a role in divertor asymmetries. The gradient of the plasma potential, $V_p = V_f + 2.5T_e$, reaches ∼5 kV/m across the SOL-private boundary, causing a poloidal particle flux, calculated as, $\Gamma_\theta = 2\pi R n_e(V_{p1} - V_{p2})/B_T$, (along flux surfaces) of about $\sim 10^{22} s^{-1}$, comparable to the target flow of $2\times10^{22} s^{-1}$, and consistent with previous work [1]. Floating potential V_f, temperature T_e, density N_e, and D^+ flow were measured in the DIII-D divertor. The data will be compared to simulations by SOLPS and UEDGE. The D^+ parallel flow velocity, $V\|$, calculated by multiplying the Mach number by the local sound speed $c_s = (\gamma Z k T_e/m_i)^{1/2}$ show increasing velocity towards the plate in attached conditions and bulk sonic flows over the whole detached region in detached conditions. We compare measurements in the divertor to similar measurements made at the midplane to show how divertor conditions reflect upstream.
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