Abstract Submitted
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Modification of turbulent transport with continuous variation of flow shear in the Large Plasma Device[1] TROY CARTER, DAVID SCHAFFNER, GIOVANNI ROSSI, DANIEL GUICE, JIM MAGGS, STEPHEN VINCENA, BRETT FRIEDMAN, UCLA — The LArge Plasma Device (LAPD) at UCLA is a 17 m long, 60 cm diameter magnetized plasma column with typical plasma parameters $n_e \sim 1 \times 10^{12}\text{cm}^{-3}$, $T_e \sim 10\text{eV}$, and $B \sim 1\text{kG}$. Broadband, fully-developed turbulence is observed in the edge of the LAPD plasma along with spontaneously driven azimuthal flows. Recently, the capability to continuously vary the edge flow and flow shear has been developed in LAPD using biasing of an annular limiter. Spontaneous flow is observed in the ion diamagnetic direction (IDD), biasing tends to drive flow in the opposite direction, allowing a continuous variation of flow from the IDD to the electron diamagnetic direction, with a near-zero flow and flow shear state achieved along the way. Enhanced confinement and density profile steepening is observed with increasing shearing rate; degraded confinement is observed when spontaneous flow is nulled-out and near-zero shear is acheived. Particle flux and radial correlation length are observed to decrease with increasing shear. The decrease occurs with shearing rates which are comparable to the inverse turbulent autocorrelation time in the zero flow state.

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