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Suppression of turbulent particle flux during biased rotation in LAPD T.A. CARTER, J.E. MAGGS, R.J. TAYLOR, UCLA — The edge plasma in LAPD is rotated through the application of a bias voltage (typically 100V-200V) between the plasma source cathode and the vacuum vessel wall. Without bias, cross-field turbulent particle transport causes the density profile to extend well past the cathode edge, with a fairly gentle gradient ($L_n \sim 10$ cm). As the bias voltage is applied and increased past a threshold value, the measured density profile steepens dramatically ($L_n \sim 2$ cm) at a radius near the peak of the flow shear. Turbulent transport flux measurements in this region show that the flux is reduced and then suppressed completely as the threshold is approached. As the bias voltage is increased further, the measured turbulent transport flux reverses direction. The amplitude of the density and azimuthal electric field fluctuations is observed to decrease during biased rotation, the product of the amplitudes decreasing by a factor of 5. However the dominant change appears in the cross-phase, which is altered dramatically, leading to the observed suppression and reversal of the turbulent flux. Detailed two-dimensional turbulent correlation measurements have been performed using the high repetition rate (1 Hz) and high reproducibility of LAPD plasmas. In unbiased plasmas, the correlation is localized to around 5 cm radially and a slightly smaller distance azimuthally ($\rho_s \sim 0.5 - 1$ cm). During biased rotation, a dramatic increase in the azimuthal correlation is observed, however there is little change in the radial correlation length.

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