

Abstract Submitted
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Overview of studies of turbulence, transport and flows in the Large Plasma Device T.A. CARTER, D. SCHAFFNER, UCLA, G. ROSSI, UT Austin, B. FRIEDMAN, J.E. MAGGS, D. GUICE, S. VINCENA, UCLA, M.V. UMANSKY, LLNL — The Large Plasma Device (LAPD) at UCLA is a 17m long, 0.6m diameter linear magnetized plasma in which broadband edge turbulence driven by pressure and flow gradients is observed. Particle transport barriers are observed with bias-driven cross-field flows in LAPD.¹ New biasable limiters have been installed, allowing for a continuous variation in the edge flow and flow shear. Initial experiments using this new capability have shown confinement degradation at low flow/shear and improved confinement with both positive and negative azimuthal flow and flow shear. The 3D Braginskii fluid turbulence code BOUT (and now BOUT++) has been modified for and verified in cylindrical geometry for application to LAPD.² Nonlinear simulations yield good qualitative and semi-quantitative agreement with LAPD data³ Finally, a new fast-framing camera has been applied to imaging visible light fluctuations in LAPD as a turbulence diagnostic and initial results will be discussed.

¹J. E. Maggs, et al. Phys. Plasmas 14, 052507 (2007); T. A. Carter and J. E. Maggs, Phys. Plasmas 16, 012304 (2009)

²P. Popovich, et al. Phys. Plasmas 17, 102107 (2010)

³P. Popovich, et al., Phys. Plasmas 17, 122312 (2010)

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