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Drift wave turbulence simulations in LAPD P. POPOVICH, UCLA, M. UMANSKY, LLNL, T.A. CARTER, D.W. AUERBACH, B. FRIEDMAN, D. SCHAFFNER, S. VINCENA — We present numerical simulations of turbulence in LAPD plasmas using the 3D electromagnetic code BOUT (BOUndary Turbulence). BOUT solves a system of fluid moment equations in a general toroidal equlibrium geometry near the plasma boundary. The underlying assumptions for the validity of the fluid model are well satisfied for drift waves in LAPD plasmas (typical plasma parameters $n_e \sim 1 \times 10^{12}\text{cm}^{-3}$, $T_e \sim 10\text{eV}$, and $B \sim 1\text{kG}$), which makes BOUT a perfect tool for simulating LAPD. We have adapted BOUT for the cylindrical geometry of LAPD and have extended the model to include the background flows required for simulations of recent bias-driven rotation experiments. We have successfully verified the code for several linear instabilities, including resistive drift waves, Kelvin-Helmholtz and rotation-driven interchange. We will discuss first nonlinear simulations and quasi-stationary solutions with self-consistent plasma flows and saturated density profiles.

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