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Characterization of large-scale velocity fluctuations in the Princeton MRI experiment[1] W. LOVE, Virginia Polytechnic Institute and State University, A. ROACH, E. SPENCE, P. SLOBODA, H. JI, Princeton Plasma Physics Laboratory — The Princeton MRI Experiment is a modified Taylor-Couette device that uses GaInSn as its working fluid. An Ultrasonic Doppler Velocimetry (UDV) system allows the measurement of internal fluid velocities. Starting from both hydrodynamically stable and unstable background flow states, prior work has demonstrated the existence of large-scale, large-amplitude, coherent, nonaxisymmetric velocity fluctuations when a sufficiently strong magnetic field is applied. Characterizations of these oscillations are made by looking at the dominant fluctuations in the azimuthal and radial velocity field components and matching these features to different model velocity profiles. These profiles are calculated by starting with a model azimuthal and radial flow and calculating the vertical term in the continuity equation. The relative magnitudes of the calculated azimuthal and radial flows are compared to experimental UDV data to determine the validity of the model. Additional calculated properties such as final velocity current density profiles will be presented.

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