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Characterization of large-scale velocity fluctuations in the Princeton MRI experiment W. LOVE, Virginia Polytechnic Institute and State University, A. ROACH, E. SPENCE, 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 flow and calculating the resultant radial flow, assuming no vertical dependence. The relative magnitudes of the calculated azimuthal and radial flows are compared to experimental UDV data to determine the validity of the vertical symmetry assumption. Additional calculated properties such as the Reynolds stress, current distributions, and final velocity profiles will be presented.

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