Abstract Submitted
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Testing Magnetic Diffusion in the DIII-D Tokamak[1] S. SEARS, West Virginia University, C.C. PETTY, General Atomics, C.B. FOREST, U. Wisc.-Madison, B.W. RICE, Xenogen — Magnetic diffusion governs the evolution of the current density profile in tokamak discharges. Accurate knowledge of this diffusion is needed to predict and control the current density profile in Advanced Tokamak scenarios. A novel experiment to study magnetic diffusion in the DIII-D tokamak modulated the edge loop voltage at 2-8 Hz and measured the propagation of the poloidal magnetic flux through the plasma using motional Stark effect polarimetry. To interpret the measurements, a simulation code is being developed to numerically solve the perturbed poloidal magnetic flux diffusion equation in real geometries and with real plasma profiles. Complicating factors such as (unintended) oscillations in the plasma boundary or conductivity profile are being included in this analysis. Comparisons between the simulation code and experimental data will be presented. In plasmas free of MHD, this serves as a rigorous test of neoclassical conductivity; while in plasmas with tearing modes, the anomalous consumption of flux will be examined.

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