Abstract Submitted for the Forty-Seventh Annual Meeting
Division of Plasma Physics
October 24–28, 2005, Denver, Colorado

Category Number and Subject: 5.6.2 DIII-D tokamak

[ ] Theory [X] Experiment

Magnetic Field Error Correction in DIII–D,* M.J. Schaffer, J.T. Scoville, R.J. La Haye, *GA* – Two new experiments continue to show that empirical correction of magnetic field errors is not a cancellation of the pitch-resonant Fourier components of the directly measured DIII-D field errors on the q= 1, 2, and/or 3 surfaces. MHD theory suggests that the plasma response is greatest to pitch-resonant perturbations. The experiments varied the correcting field geometries in two ways: (a) apply fields designed to null specific error component(s), and (b) systematically scan the correction field geometry applied by the I-coil. Only 2 out of 8 geometries tested yielded empirical corrections approximately equal and opposite to the machine error resonant field; in 6 cases there clearly was not cancellation. The corrected field error symptom in these experiments was plasma rotation braking leading to an unstable locked mode in low-density Ohmic plasmas, as in past experiments. Locked mode avoidance in the new experiments correlates better with cancellation of nonresonant error components than resonant. The empirical plasma response still needs to be better understood.

*Work supported by U.S. DOE under DE-FC02-04ER54698.

[ ] Oral [X] Poster