

**Abstract Submitted for the 52nd Annual Meeting
Division of Plasma Physics
November 8–12, 2010, Chicago, Illinois**

Category Number and Subject:

Theory Experiment

Non-axisymmetric Response Calculations Using a Non-ideal Two-fluid Model,* N.M. Ferraro, *ORISE*; M.S. Chu, *GA*; M.J. Lanctot, *Columbia U.*; M.S. Chance, S.C. Jardin, *PPPL* — The linear plasma response to externally applied non-axisymmetric fields is calculated for several DIII-D discharges. The response is computed using the initial-value, finite-element code M3D-C1. Calculations include viscosity, Spitzer resistivity, two-fluid effects, and rotation. Both the closed- and open-field line regions are included in the calculations, with the open-field line region treated as low-density, low-temperature plasma rather than a vacuum. The response is calculated both in the presence of a conducting wall and a resistive wall, with the resistive-wall response calculated by coupling M3D-C1 to the VACUUM code. Results of these calculations are compared with ideal-MHD calculations for the same discharges, as well as with experimental measurements.

*Supported by the US Department of Energy under DE-AC05-06OR23100, DE-FG02-95ER54309, DE-FG02-04ER54761, and DE-AC02-09CH11466.