Abstract Submitted for the DPP09 Meeting of The American Physical Society

Free Boundary Magnetohydrodynamic Equilibria with Flow¹ RONALD SCHMITT, GUNYOUNG PARK, CHOONG-SEOCK CHANG, New York University, LUCA GUAZZOTTO, University of Rochester, HENRY STRAUSS, ELIEZER HAMEIRI, HAROLD WEITZNER, New York University — Equilibria with flow are known to exhibit characteristics different from static equilibria. In particular, plasma rotation often reduces turbulent transport, as exhibited by H-mode confinement state observed in tokamaks. The equations that govern MHD equilibrium with flow are the generalized Grad-Shafranov equation and the magnetic Bernoulli equation. The finite element, free boundary equilibrium solver in the M3D code has been modified to included arbitrary toroidal and poloidal flows. The M3D+FLOW code differs from other codes in that, being a free boundary code, it includes the separatrix and the region outside the separatrix. Results for M3D+FLOW are presented for both subsonic and transonic flows. Application to data from the XGC gyrokinetic code is also presented.

¹This research was supported in part by the Fusion Energy Sciences Postdoctoral Research Program of the U.S. Department of Energy administered by the Oak Ridge Institute for Science and Education (ORISE).

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Date submitted: 17 Jul 2009

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