Abstract Submitted for the DPP10 Meeting of The American Physical Society

Plasma Response to Complex External Magnetic Perturbations¹ M.S. CHU, A.M. GAROFALO, R.J. LA HAYE, M.J. SCHAFFER, E.J. STRAIT, General Atomics, H. REIMERDES, Columbia U., Y.Q. LIU, UKAEA, T.A. CASPER, Y. GRIBOV, ITER Organization — The dependence of the plasma response to external magnetic perturbations consisting of an unknown intrinsic external error field and a known and controlled applied external field is studied theoretically by constructing various response models. For a rotating dissipative plasma, the plasma behaves nearly ideally in the linear regime. The response is relatively weak for a low beta plasma. In the quasi-linear regime, the response connects to the development of magnetic islands within the plasma. The relationship of the modeled response to that observed in DIII-D is studied. Possibility of application of this model in determination of intrinsic error field in ITER is explored.

¹Work supported in part by the ITER Organization under Task Agreement C19%D31FU and the US DOE under DE-FG02-95ER54309 and DE-FG02-04ER54761.

M.S. Chu General Atomics

Date submitted: 16 Jul 2010

Electronic form version 1.4