

Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Improved Error Field Correction in High Performance Plasmas¹

Y. IN, FAR-TECH, Inc., M. OKABAYASHI, PPPL, G.L. JACKSON, R.J. LA HAYE, P.E. SIECK, E.J. STRAIT, GA, J.M. HANSON, Columbia U., H. REIMERDES, CRPP-EPFL — Accurate error field correction (EFC) is highly desirable for high performance plasmas (e.g. steady-state, high- β plasmas). Feedback-controlled “dynamic error field correction” (DEFC) helps us not only monitor the plasma response to non-axisymmetric error fields but also determine a better EFC waveform. In recent high- β experiment, we confirmed that the use of “revised” EFC - in which the EFC waveform is pre-programmed to repeat the feedback output of a previous discharge - helped sustain the high- β phase longer than otherwise possible. This experiment used DIII-D’s C-coils, similar to ITER’s external EFC coils. Additional iteration of the DEFC will allow us to asymptotically find the “ideal” EFC waveform, achieving higher- β well above the $n = 1$ no-wall stability limit. The combination of both internal and external coils in DIII-D, which would mimic the eddy current pattern in an ideal conducting wall, is expected to deliver substantially improved EFC.

¹Work supported by US DOE under DE-FG02-08ER85195, DE-AC02-09CH11466, DE-FC02-04ER54698, and DE-FG04-04ER54761.

Yongkyoon In
FAR-TECH, Inc.

Date submitted: 26 Jul 2011

Electronic form version 1.4