

Abstract Submitted
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Improved Dynamic Response of Magnetic Feedback in DIII-D with AC Compensation LIDIA PIRON, LIONELLO MARRELLI, PIERO MARTIN, PAOLO PIOVESAN, ANTON SOPPELSA, Consorzio RFX, JEREMY HANSON, HOLGER REIMERDES, Columbia University, YONGKYOON IN, FARTECH, MICHIO OKABAYASHI, PPPL — High- β tokamaks need robust magnetic feedback to cope with various MHD modes. A new algorithm was tested to improve the DIII-D feedback dynamic response. Magnetic sensor signals include contributions from vacuum sources, such as active coils. In the present algorithm, the plasma response to an applied field is computed by subtracting from the sensor signals the dc component of couplings to the coils. But, when the coil currents vary on fast enough time scales, wall eddy currents modify the contributions to the sensor field with respect to its dc value [1]. Such ac effects can be non-negligible. Transfer functions between coils and sensors were measured and an ac compensation scheme accounting for them was developed. Significant coil current was saved likely due to a better estimate of the plasma response. Ac effects may be more important at high- β , where uncorrected error fields are strongly amplified. [1] E.J. Strait *et al.* 2003 Nucl. Fusion **43** 430. *Work supported in part by US DOE under by DE-FG02-04ER54761, DE-FG02-06ER84442, & DE-AC02-09CH11466.

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