Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Optimization of RMP Coils for ELM Control[1] SOMESWAR DUTTA, IPR, T.E. EVANS, GA, D.M. ORLOV, UCSD — Advanced DIII-D RMP coils with improved capabilities are studied using a vacuum island overlap width (VIOW) criterion. Changes in characteristics of the RMP field produced by different geometrical parameters using both ex-vessel (C- and O-) and in-vessel (I- and CP-) coils are discussed. By reducing the poloidal span of each coil, the spacing between them and varying the geometric angle between the coils and the plasma, the resonant field can be adjusted to optimize the edge VIOW criterion while minimizing core resonances. Three separate phase scans using a combination of the as built I-coils and proposed CP-coils are compared for three different equilibria. Two of these equilibria have different edge safety factors and the third one has a different gap between plasma and wall than the standard equilibrium scenario of DIII D. The scan results show that the VIOW correlation criterion is well satisfied in all three cases, resulting in a new way to optimize the RMP coils for the future reactors in order to achieve the ELM suppression criterion over a significantly wider range of fusion plasma operating scenarios.

[1]Work supported by the U.S. DOE under DE-FG02-05ER54809 and DE-FC02-04ER54698.

Someswar Dutta
IPR

Date submitted: 20 Jul 2015 Electronic form version 1.4