Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Classical m/n=2/1 Tearing Mode Stability Based on Initial Island Growth Rate of Neoclassical Tearing Modes in DIII-D ITER Baseline Scenario Discharges[1] R.J. LA HAYE, G.L. JACKSON, T.C. LUCE, GA, O. MENEGHINI, ORISE, K.E.J. OLOFSSON, F. TURCO, Columbia U., W.M. SOLOMON, PPPL — Deleterious m/n=2/1 tearing modes appear in some slowly evolving ITER baseline scenario DIII-D discharges. The destabilization is here interpreted as due to an initially positive (destabilizing) classical tearing index. Examples of 2/1 tearing occurring after at least 3 seconds into discharges are analyzed. Island width evolution is evaluated by the Mirnov magnetic probe arrays using the motional Stark effect EFIT equilibrium reconstructions and is calibrated by the electron cyclotron emission (ECE) diagnostic. The magnetics analysis code EIGSPEC is used to sort out multiple modes and determine the precise point at which the m/n=2/1 mode begins to grow. The classical stability index is determined from the modified Rutherford equation (MRE) by taking the helically perturbed bootstrap components (including both curvature and small island effects) and subtracting from the initial normalized island growth rate. The data is well described by the imbalance of the sum of the destabilizing classical tearing and the helically perturbed bootstrap current terms with the sum of the stabilizing curvature and "ion polarization" effects. Comparison of the empirically determined classical index will be made with that from the linear stability code PEST3 using kinetic EFITs from experiment.

[1]This work supported by the US DOE under DE-FC02-04ER54698, DE-AC05-06-OR23100, DE-FG02-04ER54761, DE-AC02-09CH11466.

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Date submitted: 11 Jul 2014 Electronic form version 1.4