Abstract Submitted for the DPP01 Meeting of The American Physical Society

Sorting Category: 5.6.2 (Experimental)

Stability Limits of Wall Stabilized DIII-D Discharges¹

A.D. TURNBULL, M.S. CHU, L.L. LAO, T.C. LUCE, E.J. STRAIT, T.S. TAYLOR, General Atomics, A.M. GAROFALO, G.A. NAVRATIL, Columbia U., M.S. CHANCE, M. OKABAYASHI, PPPL, D.H. EDGELL, J.S. KIM, FARTECH, M.A. MAKOWSKI, LLNL — Experiments in DIII-D have shown that rotational stabilization of the RWM is effective and that β values twice the no-wall limit can be maintained without loss of the stabilizing rotation. The key to achieving this is the correction of error fields that are amplified in wall stabilized plasmas. Calculations and experiments designed to test the ideal MHD stability limits are in close agreement and show that the β limits without a wall can be well-described by a Troyon-like scaling $\beta_N \sim \lambda \ell_i$, where λ is remarkably constant for similar discharges. The effect of pressure peaking and other profile and shape parameters is contained in the factor λ . For low triangularity discharges with a strong current ramp-up, the experiments and calculations find $\lambda \sim 2.5$ throughout the discharge evolution. For more optimized DN Advanced Tokamak discharges, $\lambda \sim 4$, consistent with the Troyon scaling for optimized equilibria.

¹Work supported by the US DOE under Contracts DE-FG03-95ER54309, DE-AC02-76CH03073, DE-FG02-89ER53297, and DE-FG03-99ER82791.

Prefer Oral Session	turnbull@fusion.gat.com
X Prefer Poster Session	General Atomics
Special instructions: Stability, MHD, Current Drive, Advanced Tokamak	

Date submitted: July 19, 2001 Electronic form version 1.4