Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Excitation of Resistive Wall Mode Instabilities by Transient MHD Events in DIII-D[1] E.J. STRAIT, G.L. JACKSON, R.J. LA HAYE, General Atomics, M. OKABAYASHI, H. TAKAHASHI, PPPL, A.M. GAROFALO, H. REIMERDES, M.J. LANCTOT, Columbia U., Y. IN, J. KIM, FAR TECH Inc. — The resistive wall mode (RWM) often limits the performance of high-beta plasmas that rely on wall stabilization of low-n kink instabilities. The RWM can be stabilized by plasma rotation, but DIIID experiments show that even discharges with significant rotation are sometimes observed to develop a large-amplitude RWM immediately following an edge-localized mode (ELM) or other transient MHD event. This is thought to be the result of a nonlinear process in which the ELM resonantly drives the stable RWM to a finite amplitude, followed by magnetic braking of the plasma rotation. Open issues include the importance of magnetic shielding by the rotating plasma, the question of whether or not the RWM develops a positive growth rate during this process, and the possible role of scrape-off layer currents. Experimental results will be compared with a simple 0-D model.

[1]Supported by the US DOE under DE-FC02-04ER54758, DE-AC02-76CH03073, and DE-FG02-89ER53297.

E.J. Strait
General Atomics

Date submitted: 21 Jul 2007 Electronic form version 1.4