Investigation of Magnetic Braking of Plasma Rotation by
Applied Magnetic Field Perturbations,*S.A. Driskill, U. Virginia,
E.J. Strait, R.J. La Haye, G.L. Jackson, General Atomics,
H.-Reimerdes, Columbia U. – Stabilization of resistive wall modes
(RWM) has been addressed by two methods: rotational stabilization
and active feedback stabilization. It has been predicted that the
rotational velocity of the ITER plasma will be insufficient to
counteract the RWM through rotational stabilization alone. To study
active feedback stabilization in current tokamaks such as DIII-D, the
plasma rotation must be slowed to below the critical velocity
threshold. In the absence of bi-directional neutral beam injectors, this
is done by applying an external torque to the system, known as
magnetic braking. The effects of magnetic braking on toroidal
rotation are investigated using non-axisymmetric coils, capable of
producing toroidal mode numbers n=1, 2, or 3. The relation of the
rotation drag to the strength, the poloidal mode spectrum, and the
configuration of the applied field are analyzed. Finally, the results are
compared to both resonant and non-resonant braking models.

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