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☐ Theory      ☒ Experiment

**Measurement of the Electromagnetic Torque on a Rotating Plasma for DIII-D,\*** N. Logan, *Brown U.*, E.J. Strait, *General Atomics*, H. Reimerdes, *Columbia U.*— We study the torque of static and rotating magnetic perturbations on a rotating plasma by deriving an estimate of the electromagnetic torque from measurements of various components of the magnetic perturbation at the wall [1]. This estimate of the torque is then used to determine whether it can account for the experimentally observed changes in the plasma rotation. Preliminary analysis of the locking of a large tearing mode shows that the measured electromagnetic torques behave according to theoretical predictions of their dependency on the magnitude of magnetic perturbations and rotational frequency [2]. The observed torque varies inversely with frequency and linearly with the square of the magnitude of the perturbation. The ultimate goal is to compare the measured electromagnetic torque against the equation of motion and theoretical predictions for the braking effect of magnetic perturbations on a rotating plasma.

[1] I.H. Hutchinson, *Plasma Phys. Control. Fusion* **43**, 145 (2001).

[2] Nave and Wesson, *Nucl. Fusion* **30**, 2575 (1990).

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