

Abstract Submitted
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Statistical Analysis of Locked Modes and their Disruptivity at DIII-D¹ R. SWEENEY, W. CHOI, K.E.J. OLOFSSON, F.A. VOLPE, Columbia U. — A database has been developed to study locking and disruptivity of neoclassical tearing modes with poloidal and toroidal mode numbers $m=2$ and $n=1$. Approximately 30,000 DIII-D discharges are studied providing statistics on the fraction of disruptions containing locked modes (LMs) and the ratio of disruptive LMs to all LMs. Other quantities analyzed include the time-scales between mode-formation and locking, and between locking and disruption, the amplitude of the mode upon locking and disruption, the existence or lack of a rotating precursor, and the toroidal phase of locking. Correlations are examined between locking and disruptivity and parameters such as plasma beta and neutral beam torque. Simple interpretations are provided in terms of island size and torques acting on the island, and implications for an automatic locked mode controller are discussed.

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