

Abstract Submitted  
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**Overview of Neoclassical Tearing Mode Studies in NSTX<sup>1</sup>** STEFAN GERHARDT, R.J. LA HAYE, E.J. STRAIT, General Atomics, R.J. BUTTERY, UKAEA, D. BRENNAN, U. of Tulsa, E. FREDRICKSON, D. GATES, PPPL, M. MARASCHEK, IPP-Garching, J.E. MENARD, PPPL, S.A. SABBAGH, Columbia University — Both the  $m/n=2/1$  and  $3/2$  neoclassical tearing modes have been observed in high-performance plasma regimes in NSTX. These instabilities are observed as fluctuations in the soft X-rays and Mirnov arrays, as sources of strong rotation damping, and as flat regions in the electron temperature profile. The neoclassical nature of the islands is confirmed by the observed linear dependence of the saturated island width on beta-poloidal, and restabilization of the islands as beta-poloidal is reduced. The  $2/1$  mode is often, but not always, observed to grow without any clear seeding event. The required drive for the  $2/1$  mode when it strikes, i.e. beta-poloidal or the bootstrap current at  $q=2$ , increases with increasing toroidal flow shear. A combination of lithium surface coatings and dynamic error field correction often eliminate the  $2/1$  mode for the duration of the discharge. The role of error fields in modifying the  $2/1$  onset threshold will also be described. Modeling efforts and future experimental research plans will be discussed.

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