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Excitation and Removal of Neoclassical Tearing Mode Islands in Tokamaks[1] R.J. LA HAYE, General Atomics — A principal pressure limit in tokamaks is set by the onset of neoclassical tearing modes (NTMs), which are destabilized and maintained by helical perturbations to the pressure-gradient driven "bootstrap" current. The resulting magnetic islands break up the magnetic surfaces that confine the plasma. The NTM is linearly stable but nonlinearly unstable, and generally requires a "seed" to destabilize a meta-stable state. Thus a good analogy is an avalanche. Once excited NTM islands are very robust but can be removed by reducing the plasma pressure (i.e. bootstrap current) sufficiently so that the meta-stable parameter space is gone; self-stabilization then occurs. Examples from the DIII-D tokamak will be presented.

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