Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Comparison of energetic particles effects on $m/n = 3/2$ and $m/n = 2/1$ modes in DIII-D[1] R. TAKAHASHI, D.P. BRENNAN, University of Tulsa, C.C. KIM, University of Washington — Experimental tokamak discharges commonly include an evolving $m/n = 3/2$ mode before a 2/1 mode onset, leading to termination of the discharge. The ideal limit of $n = 2$ is generally higher than the $n = 1$ in β_N, though the 3/2 mode typically onsets when the rational surface comes into existence off axis in reversed shear, and then evolves in a nonlinear state. All the while energetic particles are affecting both modes differently. Using an experimental equilibrium reconstruction from a hybrid DIII-D discharge with $q_{min} >\sim 1$, a linear resistive stability analysis is presented in this stage. The 3-D resistive MHD code NIMROD coupled to a δf PIC model for the energetic particles is used to study the kinetic effects of the particles on the *n=1 and n=2* modes. The linear growth is calculated at various q_{min} and β_N ranging from the resistive unstable to the ideal unstable regime. Results show the interaction of the particles with the non-resonant response on axis causes destabilization of modes as opposed to a damping effect previously reported in the higher q_{min} cases.

[1]Supported by US DOE Grant DE-FG02-07ER54931.

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Date submitted: 26 Jul 2010 Electronic form version 1.4