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On the stability of a particle driven Alfven mode localized within the minimum q in reversed shear[1] D.P. BRENNAN, University of Tulsa, C.C. KIM, Far-Tech, Inc., J.M. FINN, Los Alamos National Laboratory — Recent simulations have indicated the non-resonant m/n=1/1 mode is easily driven by particles in toroidal configurations with reversed shear and the minimum in the safety factor q just above 1. Experimental data from DIII-D also indicates a similar structure is observed in Hybrid discharges, which includes a low amplitude n=1 mode in a nonlinearly saturated state. Here we investigate the analytic properties of this 1/1 non-resonant mode driven unstable by particles, and the nonlinear evolution of the system, including resonant modes, with the delta-f kinetic-MHD model in the 3-D extended MHD code NIMROD. The mode is localized within the minimum in $q \gtrsim 1$ in reversed shear configurations. It is a stable continuum mode without particles, and has a top-hat structure with finite displacement only inside of the location of the minimum in q. The physics of this delimitation of the displacement and the mode destabilization are reviewed as the minimum in q crosses 1 and the resonant q=1 mode becomes unstable.

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