Abstract Submitted
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Nonlinear stability of rotating plasmas in a mirror geometry[1] A. Y. AYDEMIR, Institute for Fusion Studies, The University of Texas at Austin, TX 78712 — In a previous work, we studied the magnetohydrodynamic (MHD) equilibrium and stability of a mirror plasma in which a strong azimuthal rotation is driven by an externally applied radial electric field[1]. Although the interchange-stabilization through flow-shear[2] was confirmed, centrifugally confined "detached states" obtained in this geometry were found to be linearly unstable to a wide range of other fluid modes driven by the rotation itself. These negative linear stability results left open the question of whether the unstable modes would be nonlinearly stabilized at modest amplitudes or have catastrophic consequences. The goal of the present work is to follow their nonlinear evolution and determine their effect on confinement.

[1] A. Y. Aydemir, Phys. Plasmas **11**, 5065 (2004).

[2] Yi-Min Huang and A. B. Hassam, Phys. Rev. Lett. **87**, 235002-1 (2001).

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Ahmet Y. Aydemir
Institute for Fusion Studies, The University of Texas at Austin, TX 78712

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