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Effect of Rotation on Stability of MHD Modes in Tokamaks with Low Magnetic Shear[1] M.S. CHU, General Atomics, L. CHEN, L.J. ZHENG, University of California, Irvine — A modified self-adjoint variational (energy) principle has been utilized to study analytically the effect of rotation and rotational shear on the stability of ideal MHD modes located in the low shear region of the tokamak. Results are compared with those obtained numerically from the MARS code with the inclusion of plasma rotation. These effects are noted. First, the location of Alfvén resonance of the MHD mode within the plasma is modified by the rotational shear. Second, the Alfvén wave restoring force is weakened by flow shear. Third, the centrifugal effect always provides a destabilizing effect. The combined results of these effects of rotation and rotational shear on the ideal double kink mode[2] and the infernal mode in reversed shear and weak shear tokamaks are examined. Analytic results for the large aspect ratio circular tokamaks and comparison with the numerical results from MARS are presented. Numerical results also show extension to cases of the noncircular tokamaks.

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[2]C.G. Gimblett *et al.*, Phys. Plasmas **3**, 3369 (1996).

☐ Prefer Oral Session
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