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Ion sound effects on magnetic island stability in slab geometry[1]
RICHARD FITZPATRICK, Institute for Fusion Studies, University of Texas at Austin — Two-fluid drift-MHD theory is used to calculate the ion polarization term in the Rutherford evolution equation of a quasi-static constant-psi magnetic island. The analysis is for cold ions, but takes the magnetosonic wave into account. It is found that an island rotating in a certain range of frequencies radiates electrostatic drift waves. These waves give rise to a radiative electromagnetic torque acting on the island. The magnetosonic wave acts to extend the range of frequencies in which drift-wave emission occurs. The sign of the polarization term remains the same as that predicted by MHD theory, even when the island emits drift-waves.

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