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Linear stability of drift-cyclotron loss cone waves in H-mode plasmas[1] W.A. FARMER, LLNL, G.J. MORALES, UCLA — The drift-cyclotron loss cone mode was first studied in mirror machines. In such devices, particles with small pitch angles are not confined, creating a hole in the velocity distribution function that is a source of free energy and leads to micro-instabilities in the cyclotron-range of frequencies. It has been shown by deGrassie et al. [1] that particle loss also occurs for certain regions of velocity space in the H-mode, edge gradient region of a tokamak. In this case, gradient drift carries particles moving opposite to the plasma current (counter-Ip) preferentially into the divertor. The preferential loss of counter-Ip particles leads to an intrinsic toroidal velocity within the plasma. The present theoretical study explores the possibility that this depletion of portions of the distribution function may result in the destabilization of drift-cyclotron waves as in mirror machines.

[1] J. S. deGrassie, R. J. Groebner, K. H. Burrell, and W. M. Solomon. Nucl. Fusion 49, 085020 (2009)].

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