Abstract Submitted
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Strongly driven drift modes independent of resistivity in finite beta plasmas[1] CHINGPUI HUNG, ADIL HASSAM, IREAP, University of Maryland — We study drift waves (DW) in collinear magnetic field, beta $\sim$ O(1) systems (e.g., FRCs), wherein the sonic and Alfven drift branches are strongly coupled. For isothermal perturbations, we find that finite beta is strongly stabilizing. With temperature perturbations, we find a rapidly growing instability, mediated by the Braginskii thermal force but not requiring resistivity. The growth rate peaks at the drift frequency. This mode has been described by Mikhailovskii but has not been well studied. The nonlocal and nonlinear theory of this mode is investigated. A finite beta 3D 2-fluid code with Hall terms and thermal force has been developed. The linear thermal force DW is confirmed. The code is also used to investigate dispersion characteristics and the ensuing turbulence. The code will also be used to study the interplay between DWs and the plasma thermoelectric effect. The latter effect generates a B x grad[T] current in magnetized plasmas and is of the same order as the plasma resistivity limited current in finite beta plasmas. It is of interest to study how drift wave turbulence would influence the thermoelectric effect and vice-versa.

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