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Theory     Experiment

**Low Frequency Response of Plasma to MHD Perturbations,\*** M.S. Chu, *General Atomics*, and Y.Q. Liu, *Chalmers University* – MHD stability of the plasma depends critically on the frequency and wave length of the perturbation. Future tokamaks are expected to operate in regimes where the external macro-scale perturbations have much lower frequencies than the intrinsic dynamical time scales of the particles [1]. This situation calls for a detailed re-examination of the assumptions on previous models of the response of the plasma to MHD perturbations [2]. The kinetic formulation of MHD response [3] is examined numerically in this work. The energy and momentum flux across the plasma surface is expressed in terms of the MHD perturbations. Implication on the stability and plasma response [4] relevant for the resistive wall mode, with its time scale dramatically reduced by the external resistive wall, is discussed.

[1] B. Hu, *et al.*, *Phys. Plasmas* **12**, 057301 (2005).

[2] A. Bondeson and M.S. Chu, *Phys. Plasmas* **3**, 3013 (1996).

[3] T.M. Antonsen, Jr. and Y.C. Lee, *Phys. Fluids* **25**, 132 (1982).

[4] Y.Q. Liu, *et al.*, *Phys. Plasmas* **7**, 3681 (2000).

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