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Error field locking of real frequency tearing modes[1] A.J. COLE, Columbia University, J.M. FINN, Tibbar Plasma Technologies, Los Alamos, D.P. BRENNAN, Princeton University — It has been shown [1] that the Maxwell torque on the plasma in the presence of an applied error field is modified significantly for tearing modes having real frequencies near marginal stability. In this poster we derive the tearing mode dispersion relation with pressure gradient, field line curvature and parallel dynamics both with and without perpendicular resistivity in the resistive-inertial (RI) and visco-resistive regimes, neglecting the divergence of the E B drift. We find the usual Glasser effect, which involves real frequencies, is retained in this simplified model in both regimes, and that the existence of tearing modes with complex frequencies is related to nearby electrostatic resistive interchange modes. The interchange modes themselves are found to move into the sound wave continuum (for the case with no perpendicular resistivity) as the sound speed is increased. Results are also presented for the case of parallel dynamics with perpendicular resistivity, to investigate the tearing mode behavior when the sound wave continuum is discretized into a finite set of modes on the stable side of the frequency space. References: [1] J. M. Finn, A. J. Cole, and D. P. Brennan, PoP (Letters) 22, 120701 (2015).

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