Abstract Submitted
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Diamagnetic effects in driven magnetic reconnection[1] JULIO MARTINELL, ICN, UNAM, Mexico, JESUS RAMOS, PSFC, MIT — We use the two-fluid equations recently derived in [1] to study magnetic reconnection about a neutral X-point in a weakly collisional plasma, driven by external bulk flow. The equations include finite Larmor radius effects and are valid for arbitray density and temperature gradients thus accounting for complete diamagnetic effects. They also allow for strong temperature anisotropies and arbitrarily large fluctuation amplitudes, which make them appropriate for nonlinear studies. The resulting reduced model, in which the fast magnetosonic wave is suppresed, consists of seven fields: density n, four pressures $p_{\alpha\parallel}$, $p_{\alpha\perp}$, magnetic potential ψ and electric potential Φ. The evolution of the system is followed using a numerical code producing a forcing from the edge of the integration domain that starts from zero during a finite time (Taylor problem). We proceed by adding different effects gradually in order to asses the role of each one and comparing with a standard reduced model [2] without the electron inertia. The first and simplest case is for an isotropic plasma with constant temperature. Then we include finite temperature gradients and finally the effect of anisotropic pressures for both ions and electrons. [1] J.J. Ramos, Phys. Plasmas **14**, 052506 (2007) [2] T.J. Schep, et al., Phys. Plasmas **1**, 2843 (1994)

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