

Abstract Submitted
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Nonlocal Property of a Hall-MHD Contact Discontinuity¹

ELIEZER HAMEIRI — A contact discontinuity may model a transport barrier or a plasma-vacuum interface. One outstanding question concerning such a discontinuity is whether, in a two-fluid plasma, the electron fluid is allowed to cross the discontinuity even if the ion fluid does not (because of the “contact” nature). Indeed we find that such a situation is possible in Hall-MHD, implying that the discontinuity problem is a global problem, where in order to preserve charge neutrality in the volume bounded by the contact discontinuity, electrons leaving the volume at one point have to be compensated for by electrons crossing in the opposite direction at another point. We carry out a full linear treatment of a toroidal plasma, deriving also stability criteria that conflict with some previous results^{2,3} which ignored the issue of nonlocality and its implication for the appropriate jump conditions.

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²U. Schaper, J. Plasma Phys. **30**, 169 (1983).

³Rosenau et al., J. Plasma Phys. **21**, 385 (1975).

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