

Abstract Submitted
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Non-stationary magnetized axially symmetric equilibrium¹

ROBERT JOHNSON, unaffiliated — The equations of motion for a fully ionized hydrogenic plasma in applied coaxial electric and magnetic fields are analyzed, where the term for the Hall effect in the generalized Ohm's law equation picks up a factor of 1/2 relative to its usual expression. Magnetization of the medium is incorporated through the decomposition of the Hall term and the inclusion of the magnetization force, which is found to equal or exceed the gradient of the scalar pressure. A limit on the kinetic pressure obtains which corresponds to the usual limit of unity for a certain selection of parameters. Solutions of these equations for the free motion of the charges in the case of an infinite column with azimuthal symmetry are compared for various prescribed pressure profiles, where one finds that the profile near the outer edge plays an important role in the feasibility of the equilibrium.

¹arXiv:0901.0732

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