Abstract Submitted
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Cross-Magnetic-Field Diffusion Due To Quasibound State Formation[1] YASIN AHAT, CARLOS ORDONEZ, University of North Texas — Classical trajectory simulations indicate that quasibound states of hydrogen (or antihydrogen) can form in low density magnetized plasmas [C. E. Correa, J. R. Correa, and C. A. Ordonez, Phys. Rev. E 72 (2005) 046406.]. Such quasibound states form at positive energies, where the energy of the two-particle system is defined to be zero when the electron and proton are at rest with infinite separation. The formation of quasibound states may affect the rate of diffusion of electrons across a magnetic field. Electron diffusion transverse to a magnetic field occurs, in part, because the guiding center position of an electron shifts with each binary interaction between an electron and a proton. The shift associated with a single binary interaction is normally not larger than a typical cyclotron radius. However, simulations indicate that a binary interaction that results in the formation of a quasibound state can cause a shift of the electron guiding center that is much larger than the cyclotron radius before the interaction. An assessment of the effect that the formation of quasibound states may have on electron cross-field diffusion is presented.

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