

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Energy Transfer Between Antiprotons and Leptons Within a Strong Magnetic Field¹ JOSE CORREA, JONATHAN WURTELE, CARLOS ORDONEZ — Some experiments conducted at the CERN Antiproton Decelerator are aimed at creating and confining antihydrogen. In many of the experiments, energetic antiprotons are cooled by collisions with electrons within a strong magnetic field. The cold antiprotons are subsequently made to interact with positrons under a strong magnetic field leading to some recombination. In the work to be reported, an analytical model for strongly magnetized collisions is developed and applied to investigate the energy loss of antiprotons interacting with cold and warm leptons under a strong magnetic field. In this model, the strong magnetization constrains the momentum transfer to one dimension, which is parallel to the magnetic field. Thus, collisional energy transfer is dominated by short-range collisions. The result is remarkably different from the unmagnetized case. The theoretical expectations are compared with prior and new computer simulations. The agreement found reveals that the model captures important features of the interaction of electrical charges of disparate masses such as antiprotons and leptons within a strong magnetic field.

¹This material is based upon work supported by the Department of Energy under Grant No. DE-FG02-06ER54883.

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Date submitted: 16 Nov 2010

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