

Abstract Submitted
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Partially Neutralized Plasmas in Penning Traps¹ CARLOS ORDONEZ, University of North Texas — Plasma confinement configurations involving partially neutralized plasmas in Penning traps have been identified recently [C. A. Ordonez, Phys. Rev. E 67 (2003) 046401; C. A. Ordonez, J. Appl. Phys. 94 (2003) 3732.]. The configurations are intriguing in that a plasma species is confined electrostatically as one component of a partially neutralized plasma. For example, an ion plasma can be confined within a three-dimensional electric potential well. As a result, the ion density is not limited by the severe ion density limit that normally occurs in Penning traps. For confinement of low-charge- state ions, the ion temperature must be smaller than the electron temperature. However, relatively long ion confinement times have been found to be possible because the equilibration of the ion temperature and the electron temperature is a slow collisional process due to the disparate masses involved. An overview of recent progress in developing an understanding of the confinement physics associated with the configurations is presented.

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