Abstract Submitted
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Warp simulations for anti-Hydrogen trap[1] KATIA GOMBEROFF, Dept. of Phys., UCB, Berkeley, JONATHAN WURTELE, JOEL FAJANS, Dept. Phys., UCB and LBNL, DAVID GROTE, JEAN-LUC VAY, LBNL — The 3D Particle-In-Cell code, Warp, is used to study positron confinement in anti-hydrogen traps. The magnetic geometry is close to that of an experiment conducted at UC Berkeley as part of the ALPHA collaboration. In order to confine neutral anti-Hydrogen, a multipole magnetic field is added to a conventional Malmberg-Penning trap. Simulations in which the positrons are injected into the trap reproduce numerically the analytical estimates for the ballistic loss of positrons. There is a critical radius for the plasma column for which the particles do not escape. The analytical estimate of the critical radius, as a function of the fraction of the multipole magnetic field and the axial field are reproduced. In the cases studied, comparisons between quadrupole and octupole fields have shown that while most of the positrons escape the trap with a quadrupole, it is easy to design an effective trap with an octupole. We also consider simulations for plasma that is initially in equilibrium, as well as finding the equilibrium under the presence of a multipole that is slowly turned on. The effect of the slow E×B rotation drift is discussed.

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