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Molecular Dynamics Simulations of anti-hydrogen formation in a Penning trap S. X. HU, D. VRINCEANU, S. F. MAZEVET, L. A. COLLINS, Theoretical Division, Los Alamos National Laboratory, NM 87545 — Low temperature (4 Kelvin) positrons in a strong magnetic field (5.4 Tesla) of a Penning trap are attached to anti-protons to form anti-hydrogen atoms mainly by three-body recombination. In our simulations 4000 positrons and 1000 anti-protons are confined in a cylindrical geometry. A long time integration (on the order of microseconds) is achieved by using a special adaptive time step symplectic integration scheme. The error in total energy conservation is maintained under 1% over the entire simulation time interval. Enough recombination events are observed to allow statistical analysis of various quantities. Recombination dependence on initial temperature of antiprotons has also examined.

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