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Antihydrogen Relaxation from High-n to Ground State.[1] E.M. BASS, D.H.E. DUBIN, UCSD — We explore the rate at which magnetized, high-n Rydberg pairs formed in antihydrogen experiments[2] relax to deep binding. While the theoretical three-body recombination rate scales favorably with low temperature ($\nu_{TBR} \propto nb^3(n\bar{v}b^2) \propto T^{-9/2}$), pairs form with binding energies ε near the (low) thermal level.[3,4] Such atoms have classical drift orbits with negligible radiation. Collisions propel a cascade to deeper binding, but theory and simulation show an atom is unlikely to reach a radiating regime before it escapes the trap.[5] However, simulations show that the energy-loss rate does not decrease as rapidly with increasing ε as previously expected. We also discuss the mean magnetic moment of guiding-center atoms, and energy loss from adiation at deep binding, based on the classical Larmour formula and a presumption of stochastic orbits.

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