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Investigation of two-frequency Paul traps for antihydrogen production

Radio-frequency (rf) Paul traps operated with multifrequency rf trapping potentials provide the ability to independently confine charged particle species with widely different charge-to-mass ratios. In particular, these traps may find use in the field of antihydrogen recombination, allowing antiproton and positron clouds to be trapped and confined in the same volume without the use of large superconducting magnets. We explore the stability regions of two-frequency Paul traps and perform numerical simulations of small samples of multispecies charged-particle mixtures of up to twelve particles that indicate the promise of these traps for antihydrogen recombination.

Summary

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