

Positron plasma creation and manipulation in the ASACUSA Cusp experiment

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The ASACUSA experiment aims to perform a ppm measurement of the ground-state hyperfine structure of antihydrogen using a spin-polarized antihydrogen beam. The production of antihydrogen in the mixing trap, the so-called Cusp trap –due to its cusped magnetic field –is done by merging positron and antiproton plasmas. To produce a sufficient amount of ground-state antihydrogen it is crucial to have control over the density and the temperature of the positron plasma. In order to increase the number of trapped positrons, we developed and built a new accumulator to separate the trapping and accumulation region. Additionally, a new trap that was formerly used at the University of Aarhus, will be installed and tested this year.

This talk will cover general aspects of the ASACUSA experiment, the new accumulator, the new trap and recent experiments to gain control of the plasma properties.

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