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ASACUSA Status and Outlook - Hbar

Thursday, 18 September 2014 11:00 (30 minutes)

Antihydrogen is the simplest stable antimatter atomic system consisting of an antiproton and a positron. A source of antihydrogen amendable to precision spectroscopic investigation would provide a sensitive direct test of CPT symmetry. To achieve this, the ASACUSA-Cusp collaboration has developed an antihydrogen beam which will be used for Rabi-like in flight spectroscopy measurements. Antihydrogen is formed within an unique anti-Helmholtz configuration cusped magnetic field which allows spin dependent focusing and hence, produces a spin-polarized beam. During mixing of positrons and antiprotons, 80 antihydrogen atoms have been observed 2.7 m downstream of the production region where perturbing magnetic fields are negligible. The absolute count rate for atoms with principal quantum number less than 43 was 0.04/s (during a mixing cycle). This result is a significant step towards the physics goal of the ASACUSA-Cusp experiment, the precision spectroscopy of the ground-state hyperfine structure of antihydrogen.

[1] Kuroda, N. et al., A source of antihydrogen for in-flight hyperfine spectroscopy. Nature Communications 5 (2014) 3089.

Primary author: Dr MURTAGH, Daniel James (RIKEN)

Presenter: Dr MURTAGH, Daniel James (RIKEN)