

Lundi 02/05/2016, 11h00

CEA-Saclay Bât. 141, salle André Berthelot

Cold antihydrogen (\bar{H}) Synthesis for HF spectroscopy and ASACUSA Micromegas Tracker

YASUNORI YAMAZAKI

RIKEN

We proposed a so-called cusp trap scheme in 2003 as a unique scheme to synthesize and extract a spin-polarized cold antihydrogen beam into a magnetic field-free region [1], and demonstrated the formation of H beam in 2014 [2]. This scheme has high potential to realize for the first time the high precision microwave spectroscopy of the ground state hyperfine (GSHF) transitions of \bar{H} with a precision of 10^{-6} or better. The GSHF frequency of \bar{H}/H provides complementary information to the magnetic moment of \bar{p}/p regarding the CPT symmetry in the hadron sector. The magnetic moment of \bar{p} and p have recently been determined with precisions of 10^{-6} [3] and 10^{-9} [4], respectively. It is noted that the GSHF transitions of H is known with a precision of 10^{-13} employing the MASER technique. The cusp trap setup has recently been upgraded adopting a double-cusp magnet (consisting of two pairs of superconducting anti-Helmholtz coils) to strengthen the focusing ability together with an ASACUSA micromegas tracker which provides annihilation positions of $\bar{p}s/\bar{H}s$. During my talk, the latest experimental results with the upgraded setup will be presented and discussed.

References :

- [1] A. Mohri and Y. Yamazaki, Europhys. Lett. 63 (2003) 207.
- [2] N. Kuroda et al., Nature Communications 4089.
- [3] J. DiSciaccia et al., Phys. Rev. Lett. 110 (2013) 130801.
- [4] A. Mooser et al., Nature 509 (2014) 596.

Le café sera servi 10 minutes avant.

NB : La présentation d'une pièce d'identité est exigée à l'entrée du centre. Tous les auditeurs extérieurs sont priés de prévenir à l'avance Martine Oger, tél. 01 69 08 23 50, e-mail : martine.oger@cea.fr. (U.E. : délai de 24 h, hors U.E. : délai de 4 jours).