



ID de Contribution: 94

Type: Oral Presentation

Measurement of charge exchange cross sections between positronium, proton and hydrogen

mardi 10 mai 2016 12:15 (15 minutes)

The GBAR experiment will measure the free fall of antihydrogen to test the weak equivalence principle with antimatter. In order to produce this atom with a velocity of the order of 1 m/s, we will use an intermediate state, the H^+ ion, composed of an antiproton and two positrons. This ion can be slowed to such velocities and then neutralized by photo-detachment of the excess positron. Its production is foreseen through two successive reactions: $\bar{p} + Ps \rightarrow \bar{H} + e^-$ and $\bar{H} + Ps \rightarrow \bar{H}^+ + e^-$, where Ps stands for positronium: a bound state of an electron and a positron. During my thesis I'll measure the cross section of the reactions that are charge conjugate of the above, i.e. where the antiproton is replaced by a proton, with production of hydrogen and of the H^- ion. For that we use the positron source of Irfu at CEA Saclay, based on a small electron linac; a buffer gas trap and a multi-electrode Penning-Malmberg trap, with a 5 T magnetic field, to cool and trap the positrons; an SiO_2 target that produces a Ps cloud when bombarded with positrons; and a proton gun. This apparatus will later be moved to CERN where the antimatter reaction will be studied with a more powerful linac and a source of antiprotons.

Auteur principal: Mlle MAIA LEITE, Amelia (Cea Saclay)

Orateur: Mlle MAIA LEITE, Amelia (Cea Saclay)

Classification de Session: Beyond standard model

Classification de thématique: Particle Physics