

Accumulation of positrons from a linac based source

S. Niang^{1*}
for the GBAR collaboration

¹IRFU, CEA, University Paris-Saclay, 91191 Gif-sur-Yvette Cedex, France

The aim of the GBAR experiment is to measure the effect of gravity on antihydrogen atoms [1]. Those are created by interactions of antiprotons with a dense positronium cloud. The antiprotons are obtained from the decelerator complex at CERN now composed of two steps: the Antiproton Decelerator, in which the beam reaches 5 MeV energy, and ELENA where it is further decelerated to 100 keV. Positronium (Ps) is obtained by implantation of 4 keV positrons onto a mesoporous silica film. The goal is to obtain a cloud of the order of 10^{10} positrons. In order to obtain the necessary intense positron beam, a 9 MeV linac, accelerates electrons toward a tungsten target equipped with a mesh moderator. The resulting slow positron beam is then transported to a buffer gas trap where particles are cooled by interaction with nitrogen and CO₂ and accumulated in a 5T multi-ring Penning-Malmberg trap.

We present the performances of trapping and accumulation of positrons.

References

[1] P. Pérez et al., *Hyperfine interaction* 223,21 (2015)

*Corresponding author, Email: samuel.niang@cern.ch