Contribution ID : **94** Type : **poster**

Design of a detector for studies of S = -2 baryon interaction induced by stopped $\bar{p}$ annihilation

Saturday, 9 June 2018 14:30 (1:30)

Collaboration

Abstract content

The experimental determination of the baryon-baryon interaction within the baryon octet allows for the development of improved hyperon-nucleon potentials and investigation of SU(3) flavor symmetry. While for the NN-system an extended data base exists, the hyperon sector is much less explored and studies of strangeness -2 systems are practically limited to searches for the H-particle [1].
The idea of the experiment is the investigation of the strangeness -2 baryonic interactions using Ξ baryons [2,3]. The low energy phase space cooled antiproton beam which will be available from ELENA or FLAIR will allow for initiation of a reaction chain resulting in the production of a Ξ hyperon with a low recoil momentum down to zero MeV/c. This can be done by annihilation of stopped antiprotons via the double strangeness exchange reaction $(\bar{K}^*, K^{(*)})$ and further interaction of $\bar{K}^*$: $\bar{K}^* N \rightarrow K\Xi$.
Experimentally, complete kinematic reconstruction can be done with a relatively simple detection setup and efficient triggering is possible due to three delayed decays of the strange particles and high multiplicity of charged particles in the final state. This, however, requires a high-resolution tracking system and a well-defined target vertex.
In this contribution, the foreseen detector setup will be presented together with preliminary results of the MC simulations focusing on the design of the target for the efficient stopping of antiprotons.

[1] R.L. Jaffe, Phys. Rev. Lett., **38**, 195 (1977).
[2] K. Kilian, *Proc. 4th LEAR Workshop*, Villars-sur-Ollon, Switzerland, 1987, ed. C. Amsler et al., Harwood Academic Publishers Chur London, 529 (1988).
[3] D. Grzonka, AIP Conference Proceedings **793**, 190 (2005).

Primary author(s) : ALFS, Dominika (Institut für Kernphysik, Forschungszentrum Jülich)

Presenter(s) : ALFS, Dominika (Institut für Kernphysik, Forschungszentrum Jülich)

Session Classification : Poster Session