Institut de recherche sur les lois fondamentales de l'univers
SÉMINAIRE

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CEA-Saclay Bat 141, salle André Berthelot

GEM-based detector developments at GSI

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A Time Projection Chamber (TPC) has been considered for the central tracker of the PANDA experiment at the new Facility for Antiproton and Ion Research (FAIR) at Darmstadt, Germany. Installed in a ring-type experiment with 2x107 p-pbar annihilations per second it has to be operated continuously despite the presence of space charge effects. These are kept at a bearable level using GEM-based amplification providing an intrinsic suppression of ion backflow. The system promises high-accuracy tracking as well as information on the specific energy-loss and features high momentum resolution of 1

Particles emitted at angles below 22° may not be fully covered by the Central Tracker in the target spectrometer. They will be tracked with a set of large-area planar gaseous micro-pattern detectors based on GEM foils as amplification stages. In order to optimize the acceptance, these GEM-Discs have to be of large diameter of Ø0.9m, 1.12m and 1.48m and will be placed 0.81m, 1.17m, 1.53m and 1.89m downstream of the target, respectively. The current design assumes up to four double planes with two projections per plane. With the envisaged position resolution of 0.1mm the system promises sufficient momentum resolution and a double track resolution of 10mm and 5°, respectively, in the range of forward angles of 5 to 18°. The chambers have to sustain a high counting rate of particles peaked at the most forward angles due to the relativistic boost of the reaction products as well as due to the small angle p-pbar elastic scattering. With the envisaged luminosity, the expected particle flux in the first chamber in the vicinity of the 6.5 cm diameter beam pipe is about 8*104cm-2s-1. Moreover, the chambers have to work in the 2T magnetic field produced by the solenoid.

The status of the project and a report on the design and construction of the detector system as well as results obtained during the commissioning and beam experiments will presented.

Le cafe sera servi 10 minutes avant
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