

Study of the space charge effect and cross-talk in straw tube detectors for the PANDA experiment

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Collaboration

Abstract content

The PANDA experiment will be built at the FAIR facility to perform high precision tests of the strong interaction through $\bar{p}p$ and \bar{p} -A annihilations. To track charge particles, PANDA uses two straw tube trackers : cylindrical Central Tracker and planar Forward Tracker. The PANDA straws consist of very thin ($27\ \mu\text{m}$) aluminized-mylar foil and are self-supporting thanks to the application of 1 bar over-pressure of the working gas. The straws will work at very high particle fluxes reaching up to $20\ \text{kHz}/\text{cm}^2$. We have studied gas gain drop due to the space charge produced at high rates. For this we irradiated the straws with X-rays from a strong Fe-55 source. For the studies we used a prototype straw tube module for the PANDA Forward Tracker. We have also measured electronic cross-talk between neighbouring straws in the module. Details of the applied experimental method and obtained results will be presented.

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