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## Development of track and event reconstruction algorithms for the PANDA Detector at FAIR

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The future PANDA experiment at FAIR has a rich and broad physics program. Hyperon production and the study of their properties is one of them. Antihyperon-hyperon pairs can be produced in antiproton-proton collisions through the annihilation of at least one light (u, d) antiquark-quark pair and the creation of s-bar antiquark-quark pairs.

Ground state hyperons can only decay through the weak interaction and thus have long life-times. Because of this, the hyperon decay vertices will be displaced from the interaction point. Therefore, the point of origin of the track is unknown and this sets a high demand on reconstruction algorithms that can resolve these tracks. One algorithm capable of reconstructing tracks with displaced vertices is the SttCellTrackFinder. The SttCellTrackFinder uses only information from the Straw Tube Tracker (STT) of PANDA to reconstruct the transverse momentum of charged tracks. Parallel straws that were hit by a traversing charged particle are first grouped to each other through neighboring relations. A circle fit is then performed in the group of hits in the xy-plane. There are also skewed straws in the STT which will be used to extract the longitudinal momentum component. By matching the hits from the skewed straws with the circles obtained from the SttCellTrackFinder, the z-component is obtained.

In high luminosity mode, the mean time between events can be as short as 100 ns which is shorter than the drift times in the STT of up to 250 ns. A continuously sampling data acquisition scheme without hardware triggers is planned for PANDA, where events are reconstructed from time gaps in the stream of hits from one or more subdetectors with good time resolution.

The status of the development of the tools for the reconstruction of the longitudinal momentum with the STT as well as algorithms for reconstructing events will be presented.

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