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Young Scientist Forum : Comparison of pattern recognition methods for the SHiP Spectrometer Tracker

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SHiP is a new general purpose fixed target facility proposed at the CERN SPS accelerator to search for particles predicted by Hidden Portals. The SHiP detector consists of a spectrometer located downstream of a large decay volume. It contains a tracker whose purpose is to reconstruct charged particles from the decay of neutral New Physics objects with high efficiency, while rejecting background events. In this talk we will demonstrate how different track pattern recognition methods can be applied to the SHiP detector geometry. We will compare their reconstruction efficiency, ghost rate and accuracy of the track momentum reconstruction. Limitations of the methods based on the 2D projection of a track will be discussed and the approach of the pattern recognition directly in 3D will be presented. It will be shown how a track reconstruction efficiency above 99% can be achieved.

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