The STAR Time Projection Chamber

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Abstract

The STAR Time Projection Chamber (TPC) is the primary tracking detector in STAR. It is an axially symmetric detector with excellent rapidity coverage and full efficiency for tracking particles in the range from $-1 < \eta < 1$, and linearly decreasing efficiency in the range from $1 < |\eta| < 2$.

The STAR TPC has completed a successful first-year of operation. It comfortably recorded the full multiplicity of central events with the highest multiplicity events written to tape at a rate of 2 per second. We also triggered on and recorded peripheral events with multiplicities as low as two tracks per event at correspondingly higher rates to tape. The two-track resolution, dE/dx resolution, and momentum resolution were found to meet design specifications.

We will report on the performance of the TPC. Examples of its operation under various conditions will be presented, including dE/dx response, resonance mass resolution, and primary and secondary vertex decay reconstruction.