STAR TPC Testing

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A Time Projection Chamber (TPC) is the STAR detector's main tracking device. After completion at LBNL in August, 1997, the TPC and its support systems (gas, high voltage, slow controls, calibration, etc.) were assembled and tested.[1] The test setup, with enough electronics for one of the 24 TPC sectors, appears in Fig. 1. The electronics were first studied and debugged on an isolated sector, with noise, gain and stability measurements; cosmic-ray and laser tracks provided data to exercise the analysis codes.

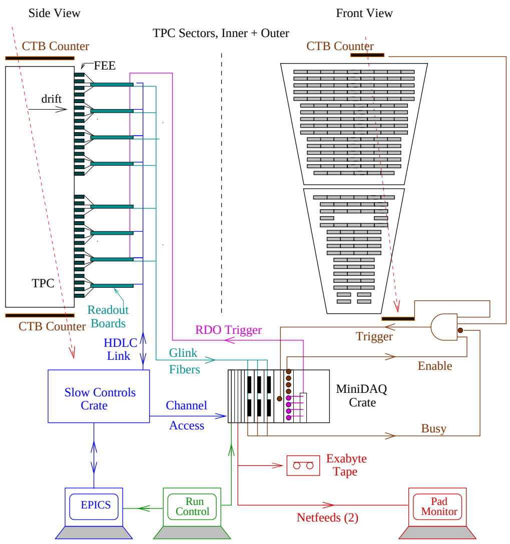

Figure 1: TPC test setup.

For the TPC itself, three sectors were instrumented successively, and the straightness of reconstructed cosmic-ray tracks was used to check for electric-field distortions. Also, ionizing laser beams provided artificial tracks; Fig. 2 displays a reconstruction for seven such laser tracks within a sector.

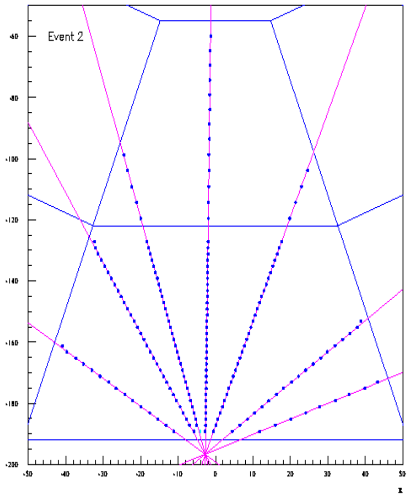

Figure 2: Reconstructed laser tracks.

Testing turned up no fundamental problems, and the TPC was shipped in early November.

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References

[1] Presentations of STAR TPC test results by H. Wieman, I. Sakrejda and E. Hjort, APS DNP Meeting, Whistler, BC, Oct. 5–8, 1997.