

Large-Area Fast-Timing Systems in STAR

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Abstract. The STAR experiment at RHIC concentrates on the tracking of charged hadrons via ionization, and the detection of electrons and photons via calorimetry, in a wide and azimuthally complete acceptance. STAR's ability to directly identify charged hadrons was initially limited to low momenta. This has been addressed via the construction of a large-area Time-of-Flight (TOF) system based on small Multigap Resistive Plate Chambers (MRPCs). The installation of the STAR TOF system was completed last fall. The full system is ran well in the recent RHIC Run 10. The operation of the system, and its performance for particle identification, during RHIC Runs 9 and 10 will be described. STAR's ability to identify muons is also extremely limited. Another large-area TOF system based on much larger MRPCs is envisioned. This system will be located outside the STAR magnet and is called the Muon Telescope Detector (MTD). Several different prototype MTD systems were operated in Runs 7 through 10, and a patch of near-final MTD detectors is under construction for use in the upcoming Run 11. The performance of the MTD prototype detectors, and the design of the Run 11 installation and the full system, will be described.

Keywords: Particle Identification; Time of flight; Multigap Resistive Plate Chamber, STAR

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The STAR experiment at RHIC has installed a large area Time Of Flight (TOF) system based on Multigap Resistive Plate Chambers (MRPCs). We have also constructed and operated prototypes of another large-area system called the Muon Telescope Detector (MTD). Views of these detectors are shown in Figures 1 and 2. Additional details on both systems are available in Ref. 1.



FIGURE 1. A view of the interior of one of the TOF trays.

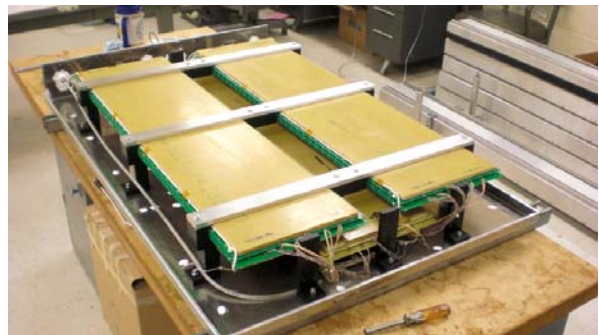


FIGURE 2. A view of the interior of the prototype MTD detector used in RHIC Runs 9 and 10.

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REFERENCES

1. W.J. Llope for the STAR Collaboration, Nucl. Inst. and Methods in Physics Research A, in press; <http://dx.doi.org/10.1016/j.nima.2010.07.086>