

Abstract Submitted
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Gas gap optimization of MRPC Time-of-Flight detector for high-energy heavy ion experiment YASUAKI TAKAHASHI — The charged particle identification (PID) provides us an essential tool to investigate a hot and dense matter created in high-energy heavy ion collisions. Recently Multi-gap Resistive Plate Chamber (MRPC) has been proposed as a cost effective, a wide coverage, and a high resolution Time-of-Flight detector for PID. MRPC has similar timing resolution compared to a conventional scintillation counter with photo-multiplier tube and a large area MRPC is relatively inexpensive and the choice of segmentation of the MRPC is also flexible. MRPC is basically the stack of glasses as the resistive plates, and gap between the glasses are filled with the non-flammable gas. The electrodes and readout pads are located on the most outer glass surfaces on both sides. Among the various control parameters, the number of gas gaps in MRPC is one of the important key conditions to be determined the detector performance. In this research, the choice of size and shape of the read pad and the number of gaps of the MRPC are varied in order to optimize design parameters and operating conditions of the MRPC. The performance of the MRPC especially on the timing resolution is studied by a cosmic ray test bench with a good timing reference signal from trigger scintillation counters and with a good pointing position accuracy from tracking chamber.

Yasuaki Takahashi

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