

A Portable MUON Track Detection System Based on Position

Resolution Sealed MRPC

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The Tsinghua University cosmic ray Muon tomography (TUMUTY) facility which based on Multi-Gap Resistive Plate Chamber (MRPC) has been established in 2012. The facility has proved the feasibility of position resolution MRPC for Muography, but still obvious defects of high gas-consumption and bulky equipment composition. Sealed MRPCs are able to decrease the gas-consumption significantly by importing the seal bar. Profiting from the abandonment of gas box, single detector can be portable. The research is focused on establishing a portable muon-track detection system based on Sealed MRPCs. Single detector is with 1 chamber of 5 gaps. 0.25mm thickness for each gap. The system is consisted with 6 detectors and each sensitive area is 450mm*450mm. GRS AD64A for data acquisition. Through different configuration of detector relative position, the system can satisfy various requirement in diverse circumstance of muography. The gases of SMRPC are C₂F₄H₂, SF₆ and i-C₄H₁₀. Gas flow is at 5sccm and field intensity is at 112V/um. Each detector's readout strips were multiplexed to reduce the size of electronics. The system has been tested by both cosmic ray and X-ray. The efficiency of single SMRPC is 96%. The position resolution is 787um.

