

Abstract Submitted
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Signal Efficiency of the Resistive Plate Chambers in the PHENIX Forward Trigger Upgrade MARK COLEY, Abilene Christian University, PHENIX COLLABORATION — PHENIX is an experiment at the Relativistic Heavy Ion Collider (RHIC) that studies polarized proton-proton and heavy ion collisions. PHENIX is in the process of upgrading the forward muon trigger to improve its capabilities of studying W-bosons. By triggering on single, high transverse momentum muons, new observations on the spin structure of a proton will be obtained. The trigger upgrade will consist of four stations of Resistive Plate Chambers (RPCs) with two stations on each side of the interaction region. Inside an RPC, there are several copper strips which form a signal plane. When a charged particle travels through the adjacent gas gaps a signal is induced on these strips. This signal propagates from the copper strip to the readout electronics. In the readout electronics, the signal is amplified and sent to a discriminator. Care must be taken when setting the chamber high voltage and the readout electronics threshold to balance the detector efficiency and noise. Lowering the threshold increases the efficiency of detecting muons but also increases the background interference. These RPCs are tested on a cosmic ray test stand to determine the optimal operating conditions. This poster will describe the RPCs, how the signal propagates out of the chamber and how the high voltage and threshold affect performance.

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