

Abstract Submitted  
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**The PHENIX Muon Trigger Upgrade Level-1 Trigger System**

JOHN LAJOIE, TODD KEMPEL, Iowa State University, PHENIX COLLABORATION — The PHENIX Muon Trigger Upgrade adds a set of Level-1 trigger detectors to the existing muon spectrometers and will enhance the ability of the experiment to pursue a rich program of spin physics in polarized proton collisions. The upgrade will allow the experiment to select high momentum muons from the decay of W bosons and reject both beam-associated and low-momentum collision background, enabling the study of quark and antiquark polarization in the proton. The Muon Trigger Upgrade will add momentum and timing information to the present muon Level-1 trigger, which only makes use of tracking in the PHENIX muon identifier (MuID) panels. Signals from new Resistive Plate Chambers (RPCs) and re-instrumented planes in the existing muon tracking (MuTr) chambers will provide momentum and timing information for the new Level-1 trigger. An RPC timing resolution of  $\sim 2$  ns will permit rejection of beam related backgrounds while tracking information from the RPCs and MuTr station will be used by the trigger to select events with high momentum muon candidates. The RPC and MuTr hit information will be sent by optical fibers to a set of Level-1 trigger processors that will make use of cutting edge FPGA technology to provide very high data densities in a compact form factor. The layout of the upgrade, details of the Level-1 electronics and trigger algorithm development will be presented.

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