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Development of Fast-Data-Formatting Circuit for High Energy Muon Trigger in PHENIX Experiment KATSURO NAKAMURA, Kyoto Univ./JSPS/RIKEN, PHENIX COLLABORATION — One of the main goals of the PHENIX experiment at RHIC is the understanding of the sea-quark polarization in a proton. Measuring the asymmetry of W boson production in polarized proton-proton collision is a powerful method to study the sea-quark polarization. The W boson is identified by the detection of a high energy muon from the decay. To acquire the data of high energy muons efficiently, an upgraded-trigger system which discriminates the high energy muons from large amount of low energy muons from hadron decays is required. One of the challenging points in this trigger system is that hit data from up to 9,500 strips of cathode-strip chambers are to be transmitted to a level-1 trigger circuit. Therefore, development of a digital circuit (MuTRG-MRG) which merges these hit data into a few data lines is necessary. In addition to the MuTRG-MRG, another digital circuit (MuTRG-DCMIF) which transmits the data to recording system is also needed for the study of the trigger performance. These two boards have been developed in KEK, installed in the PHENIX DAQ. Installed boards have been confirmed their communications with the level-1 trigger circuit and data recording module. In this presentation, the development and performance of the MuTRG-MRG board and the MuTRG-DCMIF board will be reported.

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