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Study of detection efficiency for the PHENIX muon identifier under the high rate circumstance ITARU NAKAGAWA, RIKEN/RBRC, PHENIX COLLABORATION — The PHENIX forward/backward muon arms provide capability to observe important probes to address the spin structures of hadrons. One of highlight is recent sea quark measurement via W boson production using polarized proton-proton collision at RHIC. The muon identifier (MUID) detector plays a key role to identify muons and composed by the sandwitch of multiple layers of iarocci tube planes and steel absorbers. Each tube is supplied HV through the current limiting resistor to prevent overloads. Over the course of time, RHIC has been improving luminosity plus its designed highest energy, i.e. $\sqrt{s} = 510$ GeV becomes operational. In Run13, MUID was operated under the highest rate circumstances as ever and observed significant inefficiency as low as 50% which was evaluated by regular data driven manner. Since this is a large efficiency correction, the rate dependent efficiency was estimated based on the efficiency response with respect to an effective operation voltage at the tube taking into account the voltage sag at the protection resistor. Consistency of two methods will be discussed.

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