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Development of FVTX high-multiplicity trigger system for the RHIC-PHENIX experiment

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Particle angular correlation measurements in small colliding systems, such as p+Pb, d+Au and $^3\text{He}+\text{Au}$ at RHIC and the LHC have recently attracted significant interest. In particular, high multiplicity events from such collisions exhibit azimuthal correlations between rapidity separated hadrons, so called ridge. To investigate the ridge phenomena in small colliding systems at RHIC, a new high multiplicity trigger was developed using forward silicon vertex detector (FVTX) in the PHENIX experiment. FVTX is a new multi-layer silicon endcap in PHENIX at forward/backward rapidities, mainly intended for muon DCA measurements but here being used as a high multiplicity trigger in small colliding systems. The trigger signal is formed based on the coarse online tracking of raw hits processed in the FVTX readout electronics. Details of the new trigger system and its applicability for different collision systems will be presented and discussed.

On behalf of collaboration:

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