Development of the INTT event display

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The sPHENIX Experiment¹⁾ started in May 2023 at the Relativistic Heavy Ion Collider (RHIC) in Brookheaven National Laboratory. One of the main purposes of the experiment is to study the quark gluon plasma (QGP). Au + Au collisions at a nucleonnucleon center-of-mass energy $\sqrt{s_{NN}} = 200 \text{ GeV}$ were collected.

The INTermadiate Tracker (INTT) is one of the tracking detectors in sPHENIX. The INTT is a strip silicon tracker and characterized by high time resolution. The main role of the INTT is to identify the hits with the relevant collision. INTT is a two layer, barrel-shaped structure. It is located 7 \sim 10 cm from the beam axis and covering pseudo rapidity $|\eta| < 1.1$ and full azimuth. This paper reports on the development of the INTT event display.

The event display shows the hit positions of the particles connected by a reconstructed trajectory, drawn together with the geometry of the detector. The roles of the INTT event display are to provide an at-a-glance view of the cluster position on the INTT, event by event, check the alignment of the ladder and check on the spot during an experiment that the INTT is correctly assembled and operated properly.

The INTT event display is developed based on the Root and Fun4All frameworks which is overall offline software of sPHENIX. It has some functions. It can draw hit positions and tracks with INTT geometry (active silicon sensor area). It can show two types of 2D viewer (projection of r- ϕ and ρ -z plane) and 3D viewer which can be rotated by drag and view. Figures 1, 2 and 3 show the same beam event of each viewer. One of the other function is the ability to save pictures of 2D viewers.

I completed to develop the INTT event display, a tool for visualizing INTT information and checking it during experiments. Using the developed event display, cosmic ray and beam events could be dis-

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eid :504. Nclusters: 39 Fig. 1. $r-\phi$ viewer. eid :504, Nclusters: 39 -20 -10 0 10 20 Fig. 2. ρ -z viewer. eid :504, Nclusters: 39

Fig. 3. 3D viewer.

played, and the operational status of the INTT could be checked.

Reference

1) sPHENIX collaboration, sPHENIX Beam Use Proposal, (2023).

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