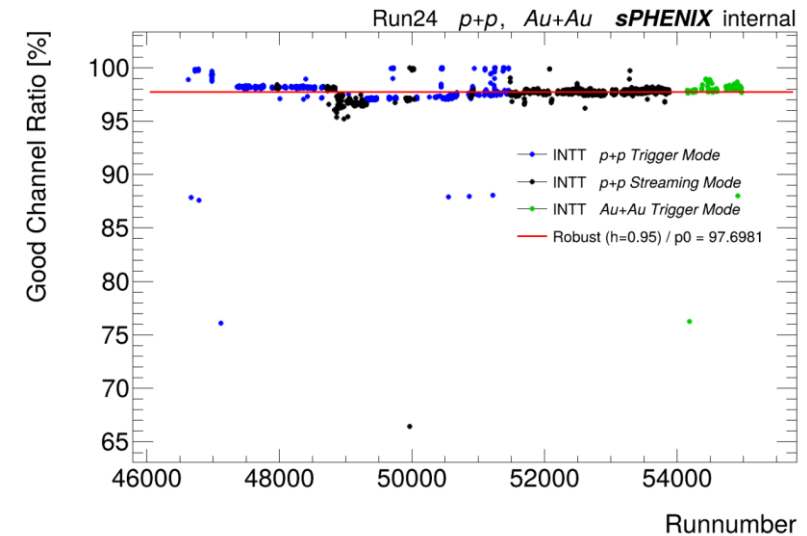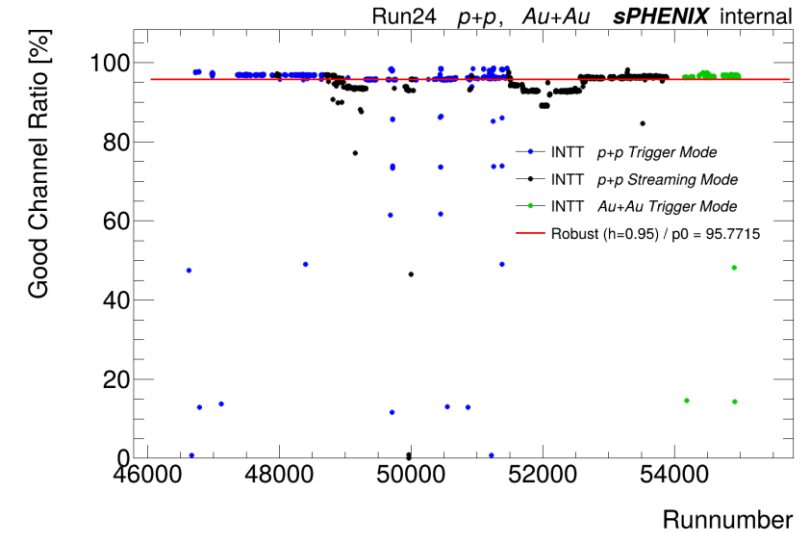# INTT Run QA

2025/03/07 Jaein Hwang, Takahiro Kikuchi

Plots of good channel ratio

- Jaein made the good channel ratio plot that exclude known dead channel.
- (Bottom one)
- Looks more stable

Calculation of integrated luminosity

- (**No idea about crossing angle, $\mathcal{L}_{\text{machine}}$ would change with 1.5 mrad**)
- $\mathcal{L}_{\text{integrated}} = \frac{N_{\text{event}}}{\sigma_{\text{MBD}}}$, where $\sigma_{\text{MBD}} = \frac{R_{\text{max}}}{\mathcal{L}_{\text{machine}} \epsilon_{\text{vertex}}}$
- $\sigma_{\text{MBD}} = \frac{R_{\text{max}}}{\mathcal{L}_{\text{machine}}}$ is known as 26 mbarn(from Cheng Wei).

In Au-Au, it's 7.1 barn (no hourglass correction)

- $\mathcal{L}_{\text{integrated}} = \frac{N_{\text{event}}}{26} \epsilon_{\text{vertex}} \text{ mbarn}^{-1}$

- N_{event} is sum of **scaled trigger or raw trigger(?).**
- $\epsilon_{\text{vertex}} = 0.14$ (from my rough calculation)

For |z|<10 cm

Vertex detection efficiency with ZDC is not applied

So rough calculation!

Result (good run ratio > 90%) (scaled)

- For MBD N&S trigger (no vertex cut)

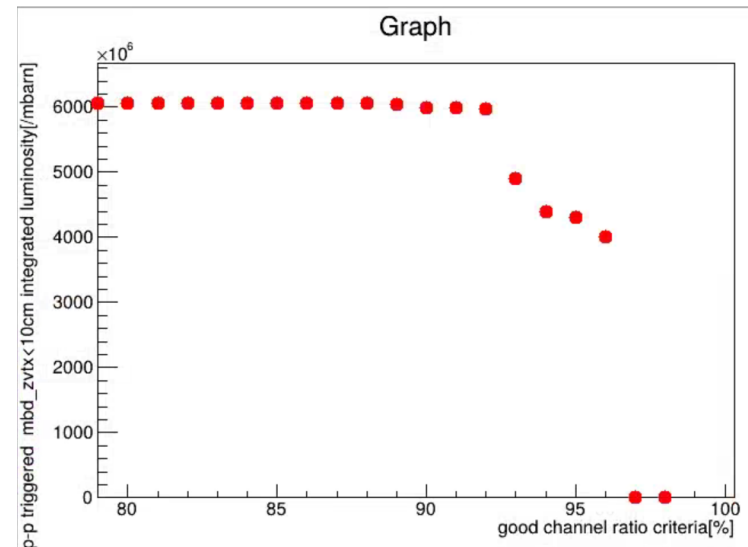$\mathcal{L}_{\text{integrated}} = 4.5 \times 10^7$ mbarn^{-1} (p-p trigger)

$\mathcal{L}_{\text{integrated}} = 2.5 \times 10^7$ mbarn^{-1} (p-p streaming)

$\mathbf{\mathcal{L}_{\text{integrated}} = 7.0 \times 10^7}$ **mbarn**$^{-1}$ (**p-p total**)

- For MBD N&S trigger (vertex<=10 cm)
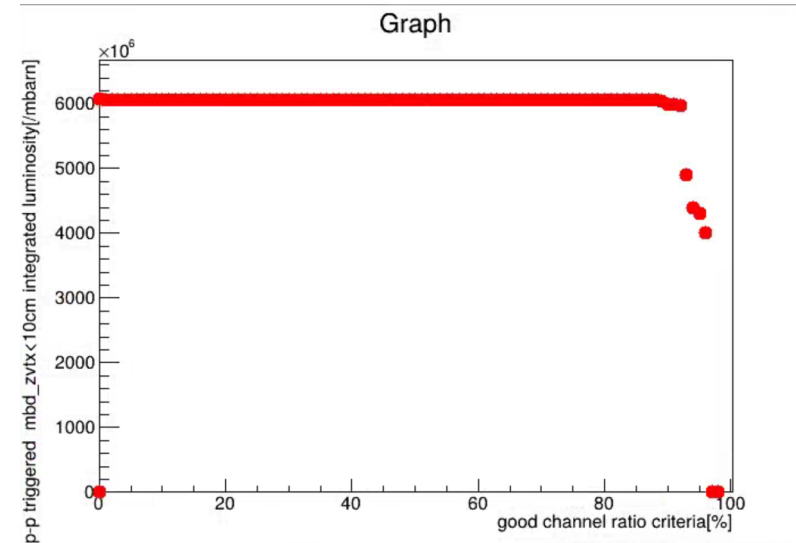
$\mathcal{L}_{\text{integrated}} = 1.1 \times 10^7/0.14$ mbarn^{-1} (p-p trigger)

$\mathcal{L}_{\text{integrated}} = 6.0 \times 10^7/0.14$ mbarn^{-1} (p-p streaming)

$\mathbf{\mathcal{L}_{\text{integrated}} = 7.1 \times 10^7/0.14}$ **mbarn**$^{-1}$ (**p-p total**)
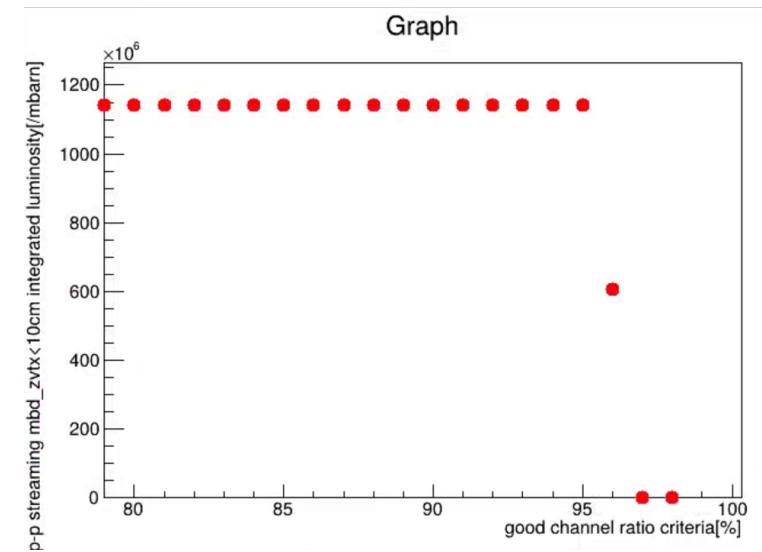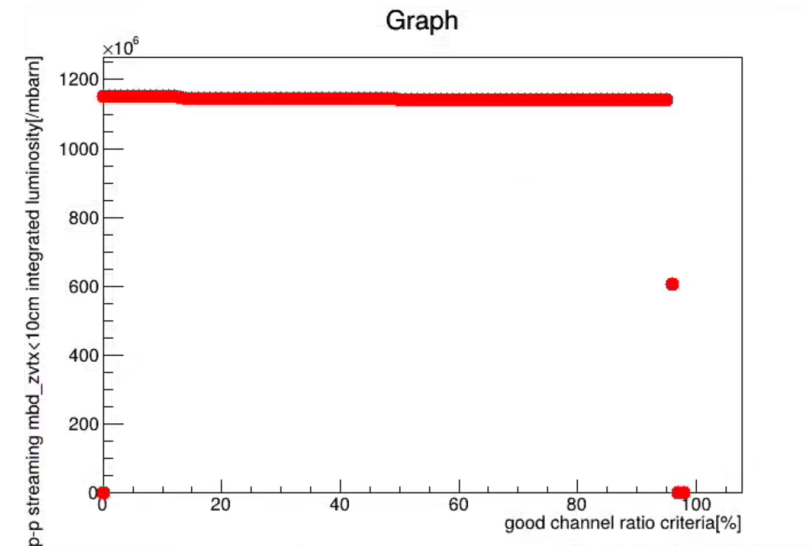
Luminosity vs good ch. Criteria (scaled)
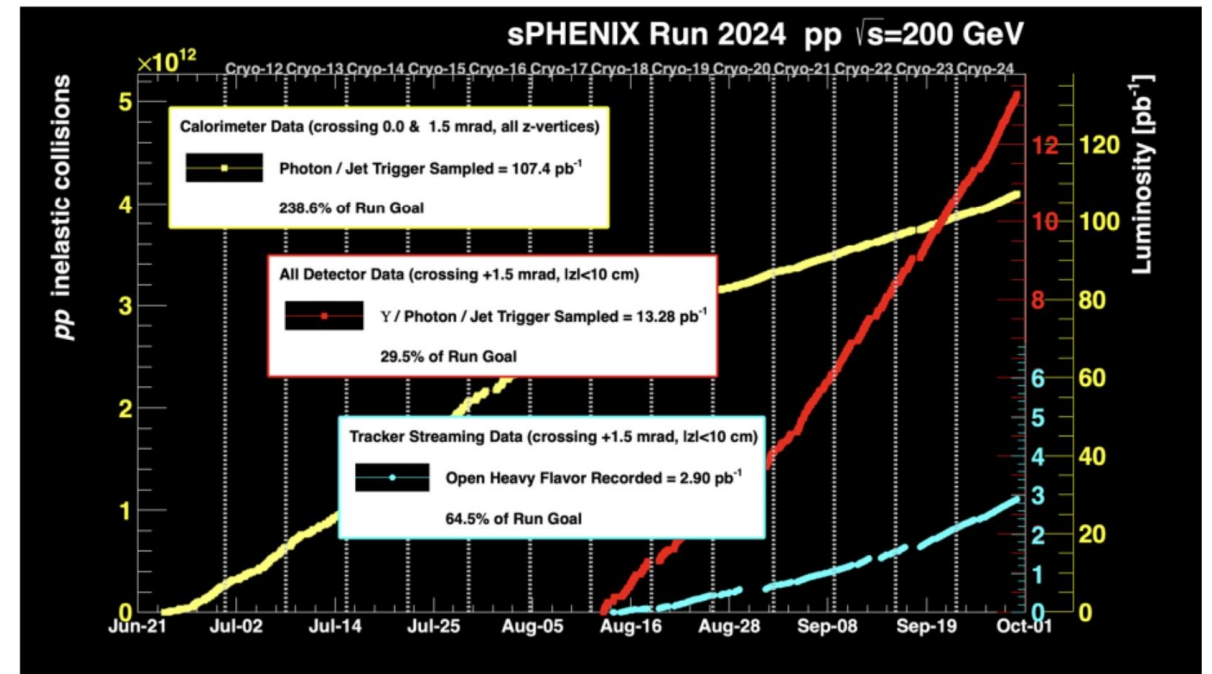

- Triggered ver.
- Constant until ~92%

Luminosity vs good ch. Criteria (scaled)

- Streaming ver.
- Constant until ~95%

Reference?

- All detector data(1.5 mrad, |z|<10 cm)

L = 13.26 pb-1

- Tracker streaming(1.5 mrad, |z|<10 cm)

L = 2.90 pb-1

- INTT (all, run=46623-54000)(scaled)

L = 0.07/0.14 pb-1

- INTT (streaming, run=46623-54000, |z|<10 cm)

L = 0.06/0.14 pb-1

One thing

- I'm using INTT setting database for checking trigger mode
- And for AuAu, trigger mode is written as "triggered" while it's described as "trigger" in pp.

Wiki and github link and google doc.

- https://wiki.sphenix.bnl.gov/index.php?title=INTT_Offline_QA
- https://github.com/sPHENIX-Collaboration/INTT/tree/main/QA_codes
- https://docs.google.com/spreadsheets/d/1HqQ7VDKrWo2ibPOf9SLO4XE6nFhlrqQZeKfOXQ4b358/edit?gid=0#gid=0