

INTT Performance Plots for RIKEN Progress Report



Aimed to be included in the progress report, if possible.

Hi Itaru,

Thanks for checking in on this, and apologies for the delayed response.

We are still discussing a bit amongst ourselves how to treat the RIKEN annual progress report.

Is it easy to give some examples of the kinds of plots you may want to include? I was personally wondering if they could also be considered “Performance” plots which has a much simpler approval.

Regarding the “Work in Progress” policy we approved, the policy is very clear that it is really for students/post-docs at national meetings/schools only, and specifically where there is no lasting slides of the work.

Dennis

On Jan 9, 2025, at 11:07 PM, Itaru Nakagawa <itaru@riken.jp> wrote:

cc: Gunther and Dave

Dear Anne and Dennis,

The nuclear physics division of RIKEN (called Nishina Center) issues an annual progress report every year. We INTT group members including students have been submitted to one page summary of their study in INTT detector. We have been limiting ourselves to include only preliminary plots in the report in the past though, it is getting hard for students. The submission deadline is end of January and it is in the season when Japanese students defend their thesis. The preliminary requires a lot longer analysis note than the one page progress report. The annual report is a kind of document, but to some extent internal to RIKEN and normally not cited from other publications. Given this fact, let me know your opinion if we can include the work-in-progress plots in the annual report.

Regards,

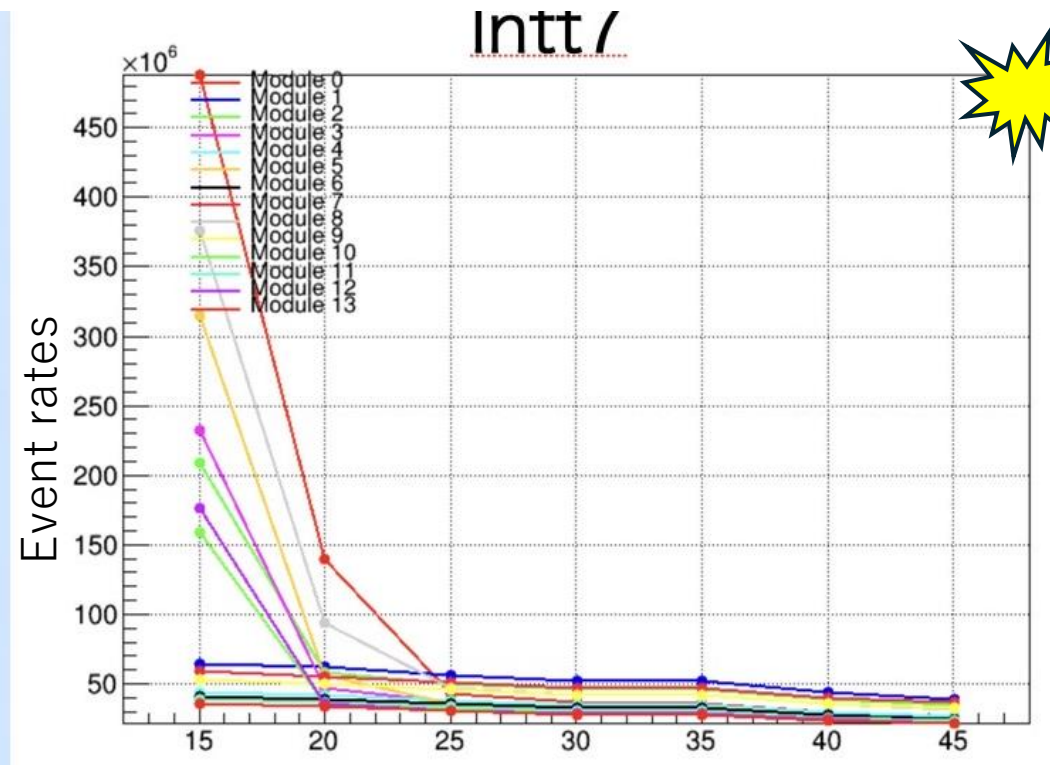
-itaru

INTT Threshold Scan Plots



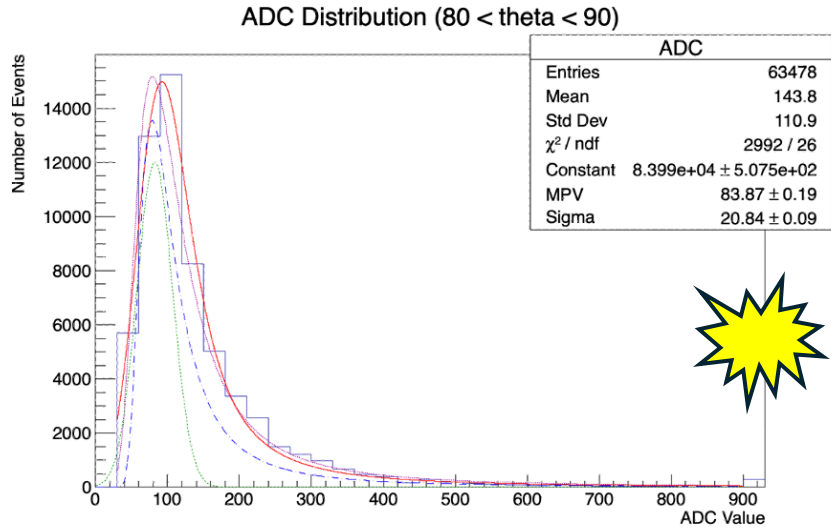
INTT's 3bits ADC Distributions for different thresholds (DAC0 value)

Event rates as a function of threshold

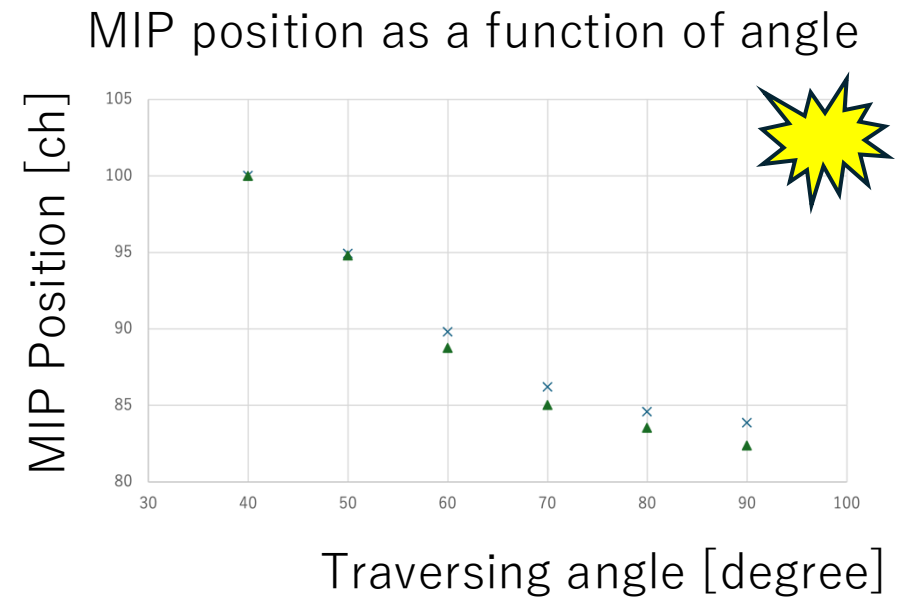
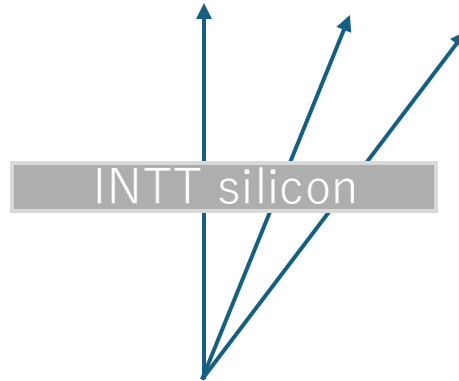


Threshold values (channel)

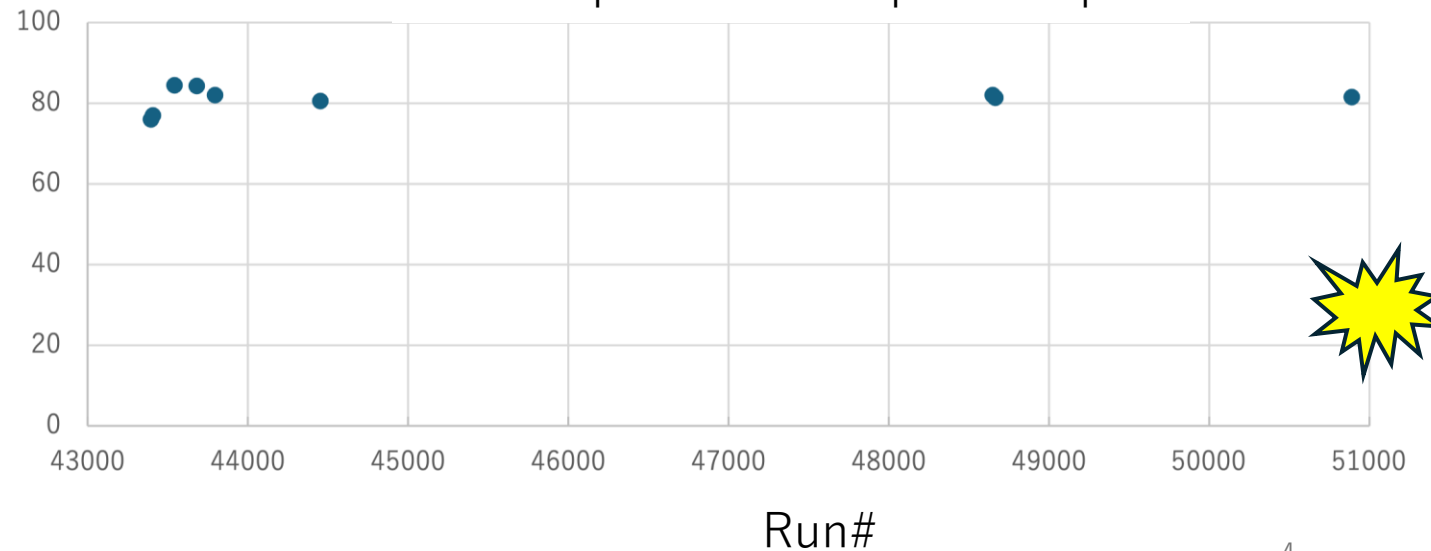
INTT MIP Distributions



INTT cluster ADC distribution and Landau fits for traversing angle of 80~90 degrees.



Time dependent MIP position plot

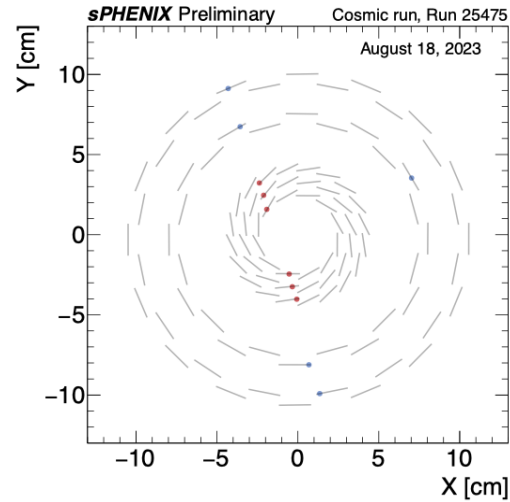
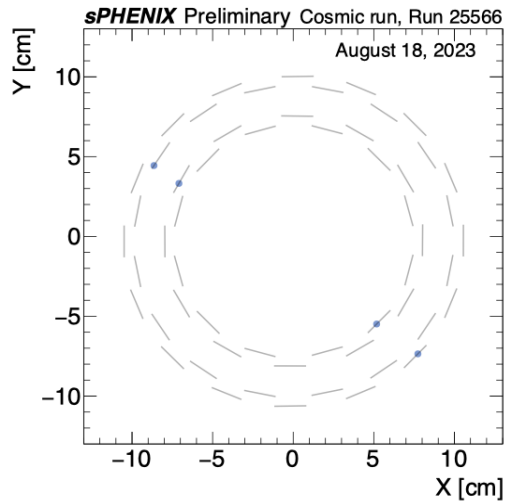


Cosmic Ray Trajectory Plots

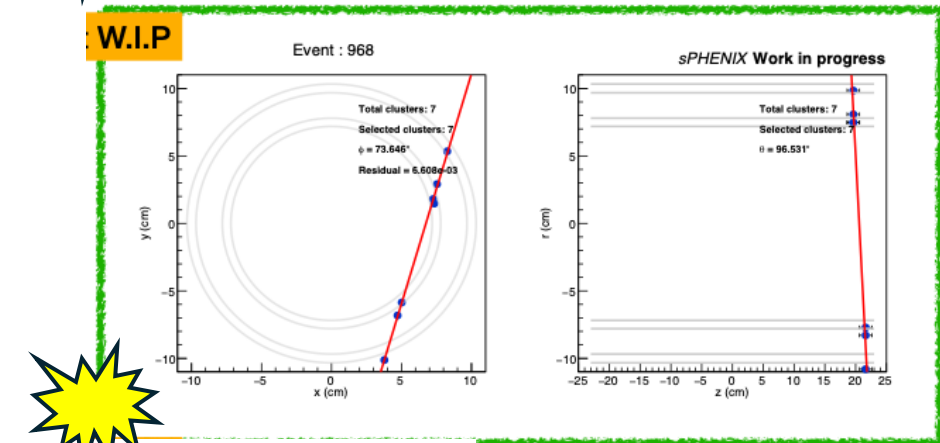
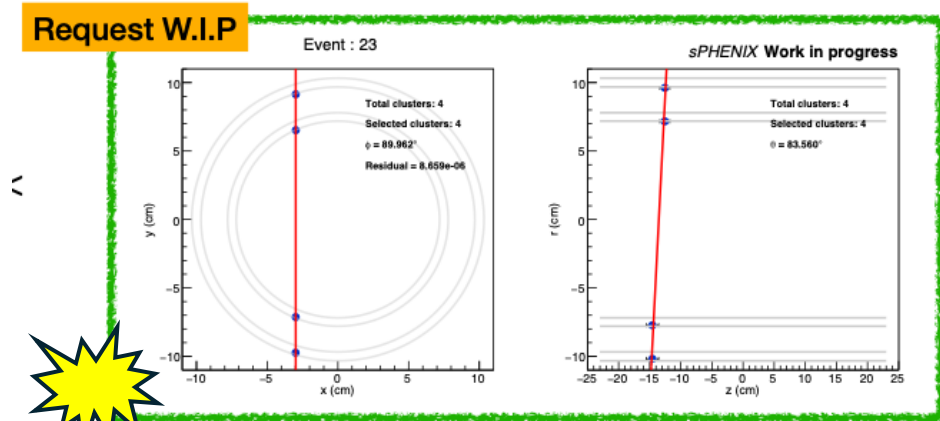
- Similar event displays are already approved as preliminaries as below

https://wiki.sphenix.bnl.gov/index.php?title=Standalone_INTT_event_display_with_cosmic_rays

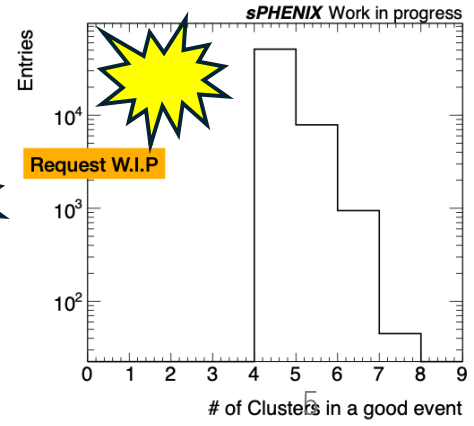
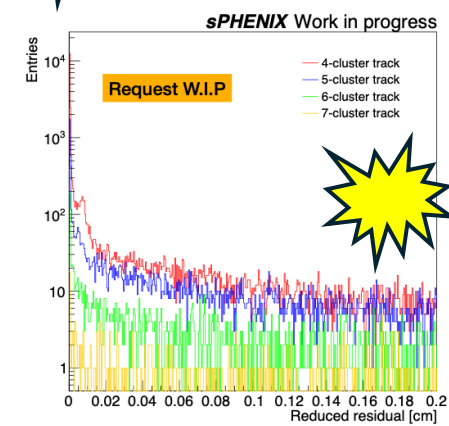
https://wiki.sphenix.bnl.gov/index.php/Released_results#Aug.2F18.2F2023



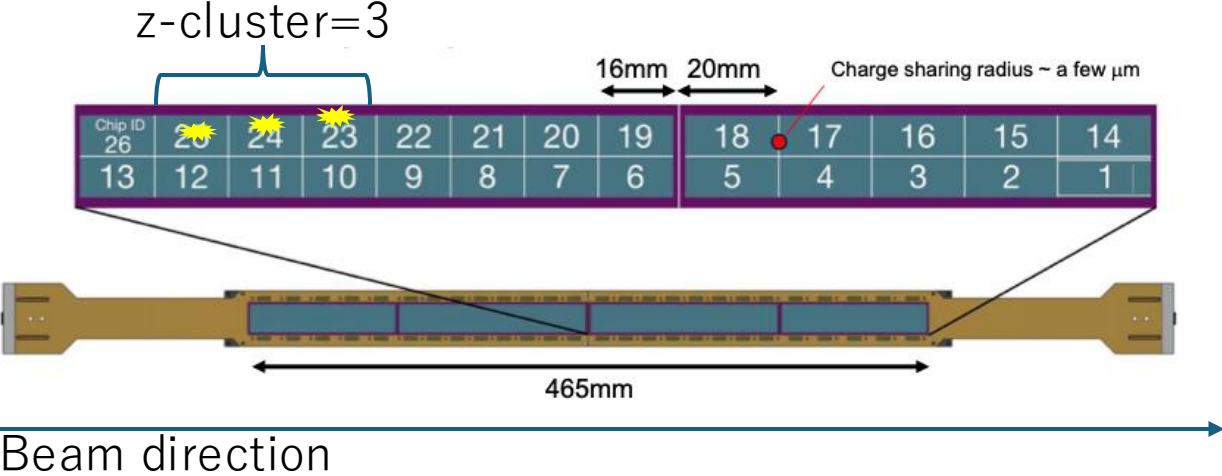
- ➔ More detailed study is underway, to reconstruct trajectories with more than 4 clusters in INTT layers.
- ➔ Right plots are performance plots for various number of clusters in the INTT layers.



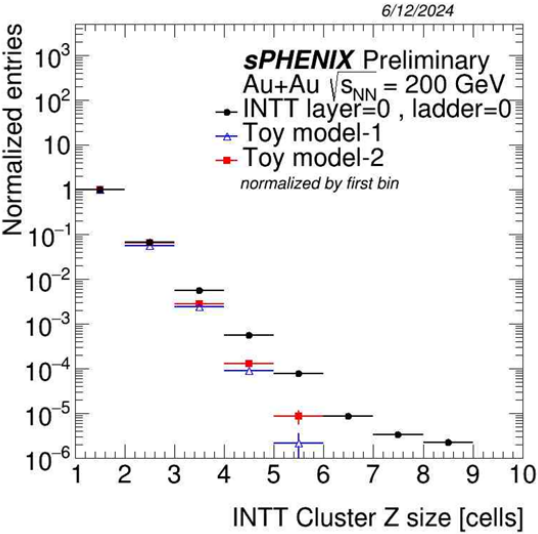
Reduced residual distribution



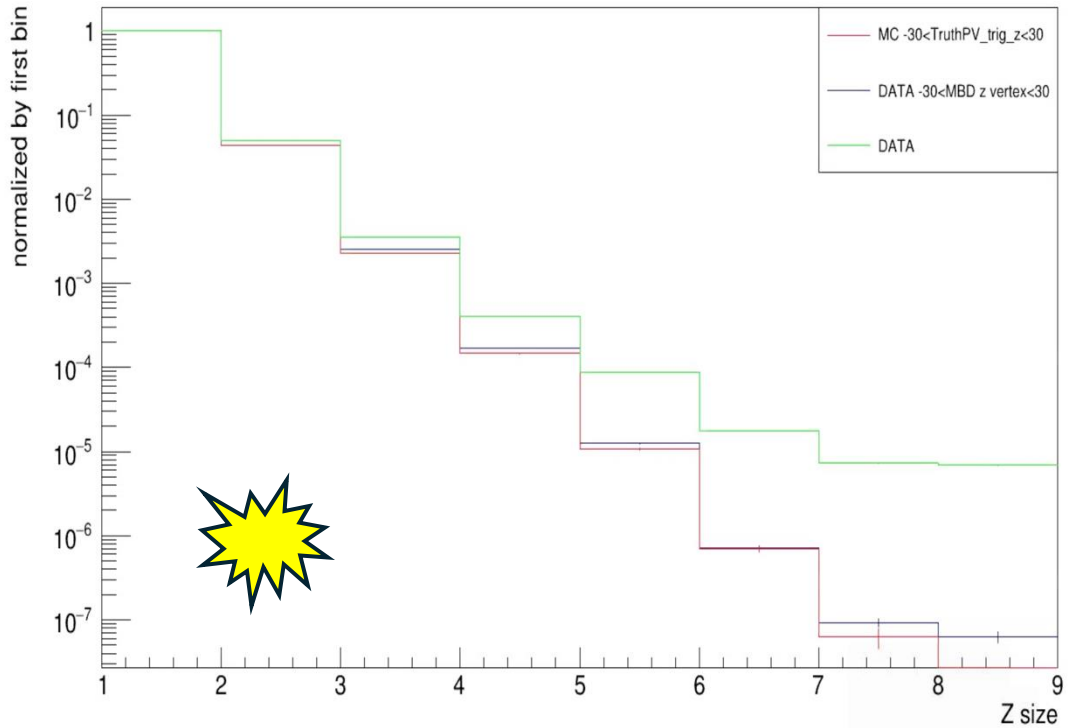
INTT z-cluster plots



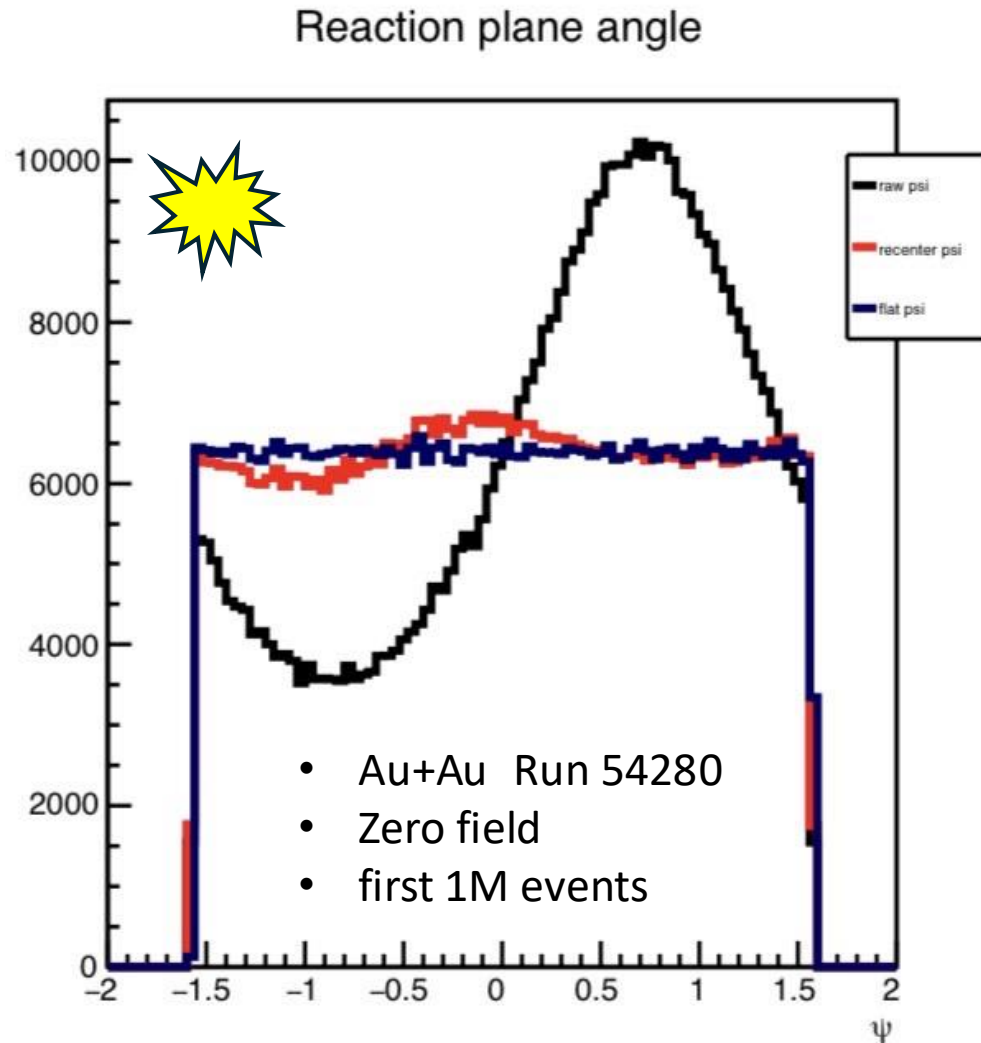
The original plots are approved in the **Special 2024 AUM Plot Approval session**
<https://indico.bnl.gov/event/23884/>



The new plot below replaces Toy model histograms by the full MC one, which is used for the analysis of the $dN/d\eta$ group. The histograms of the data are drawn with no vertex and with vertex cuts.



Reaction Plane Angle Calculation



Reaction plane calibration using MBD for raw, recentered, and flattered versions.

- Cut condition
 - Bco timing
 - hotdead channel
 - $|\text{Mbd z vertex}| < 20 \text{ cm}$
 - INTT Cluster ADC > 45

INTT Vertex Reconstruction

New plots in the right bottom are modified preliminary request plots back in June 2024 following the suggestions from Dennis as below.

On 2024/06/08 6:55, Perpelitsa, Dennis wrote:

Hi Hinako, Mario (CC: Itaru, Genki),

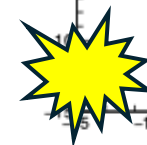
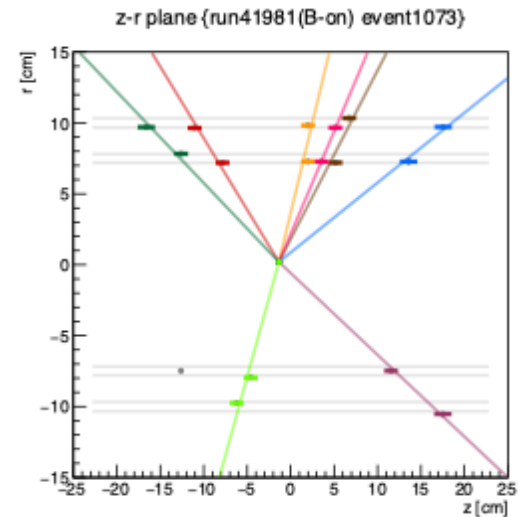
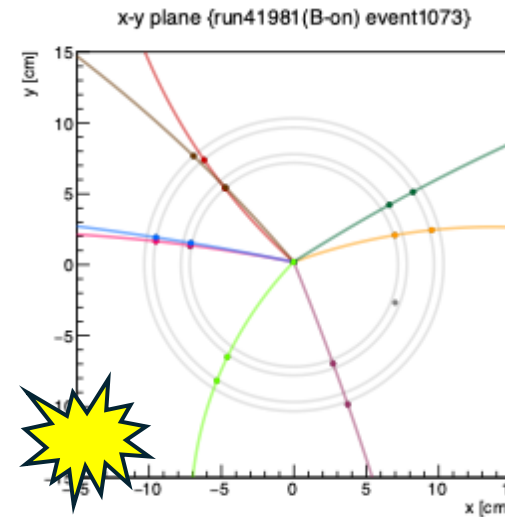
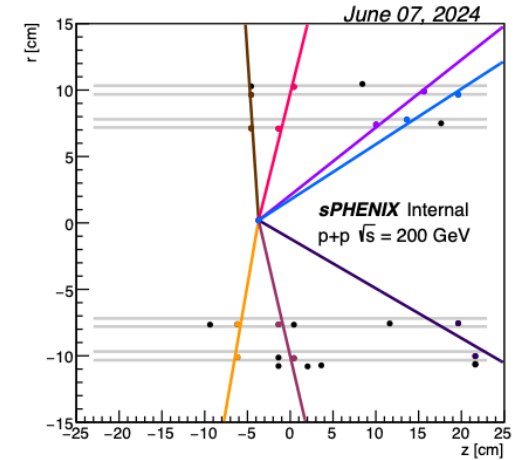
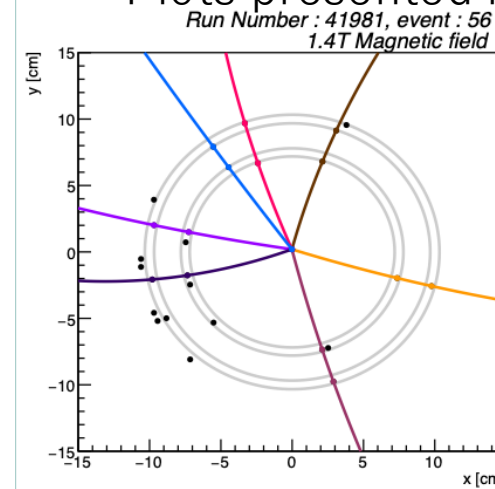
Thanks for the nice presentations and your hard work on the INTT!

Below are some notes I took from the approval

Hinako

- * The muon legend shouldn't be sqrt(s), just something like "single muons"
- * Maybe "Using nominal beamspot at (0,0)" and "Using reconstructed beamspot at (-0.02mm,2mm)"
- * truth $p_T \rightarrow p_{T_truth}$ or p_{T_truth}
- * and $p_T \rightarrow p_{T_INTT}$ or p_{T_INTT}
- * slide 9: should we have horizontal error bars to cover the bin width ?
- * slide 9: y-axis should end at -1, since it's impossible to have <-1
- * slide 10: can we have bars rather than dots for the r-z view? Since there is a non-trivial Delta z resolution for the INTT
- * slide 10: different color for the dark purple, to distinguish it from black
- * slide 9: add label that we assume fixed beam spot size at (0,0)
- * HW item: please check the cases where $p_T^{INTT} \sim 0$ (and thus $(p_T^{INTT} - p_T^{truth}) / p_T^{truth} \sim -1$) — what are those caused by? Can you send a followup to the INTT list?

Plots presented in the approval session



New plots with better cluster selection