

INTT/1008 General Update

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J Jaein Hwang 22:54
Hi,

<https://chat.sdcc.bnl.gov/sphenix/pl/ggzsm64h6bbzimoe5zbqe4mcja>

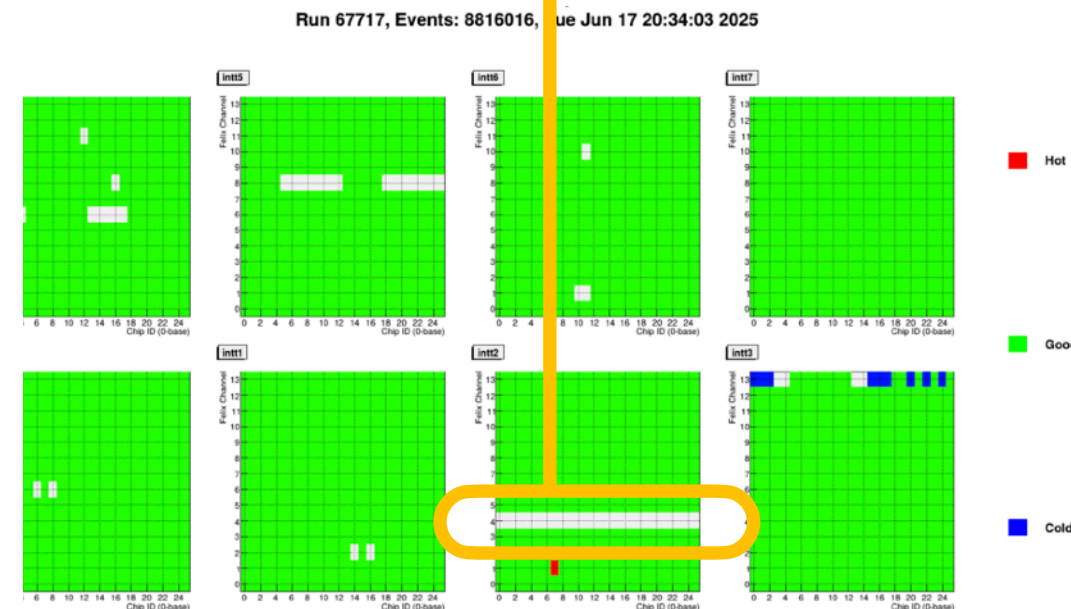
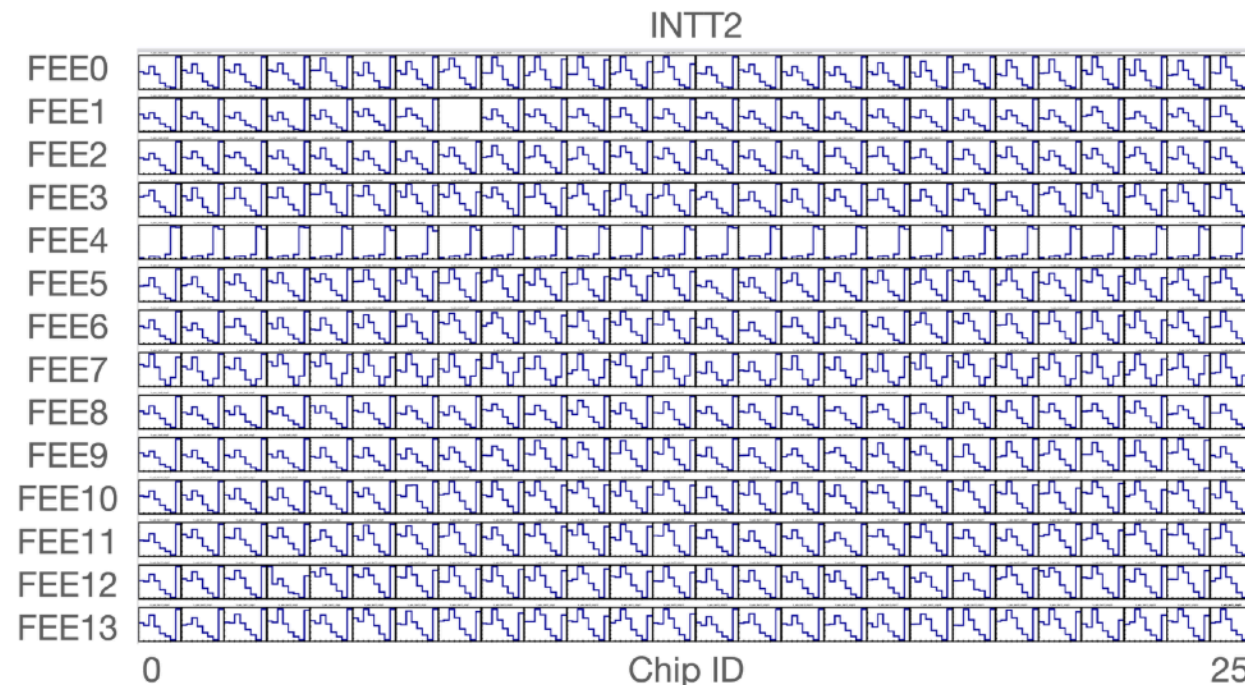
I have some concerns regarding the operation of INTT2 FEE4.
According to the calibration, INTT2 FEE4 always reports that the BCO timing is not aligned.
However, when I look at the BCO distribution for INTT2 FEE4, it seems there isn't even a clear BCO peak for this FEE.

The attached plot shows the ADC distribution of INTT2, where the y-axis represents the FEE number and the x-axis shows the chip ID.

As you can see, every chip on FEE4 exhibits abnormal behavior.

I wouldn't say the data from this FEE is healthy — I would rather consider it closer to being bad. (수정됨)

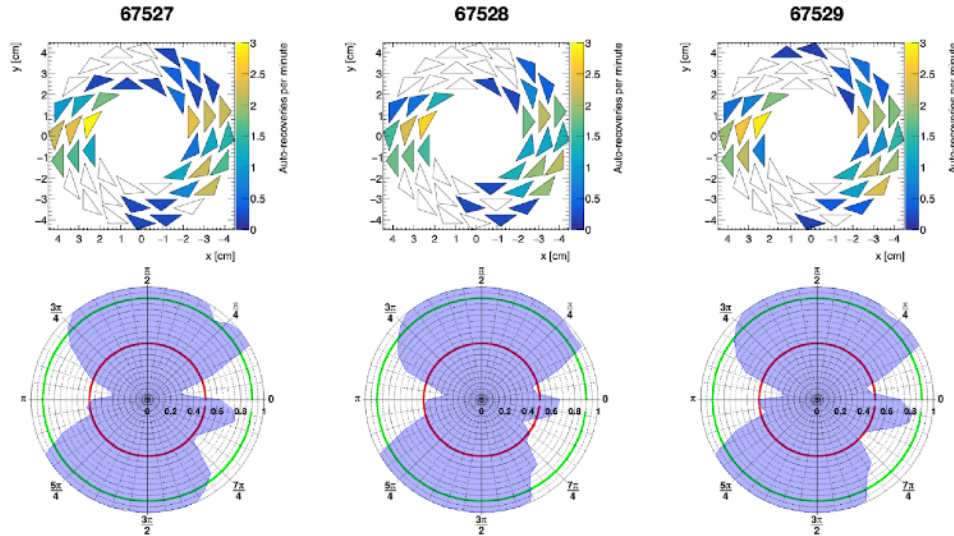
New masking ladder
due to PLK chip die



MVTX in Streaming mode

111x111 collisions

June 15th; **Streaming mode**; run 67527, 67528, 67529

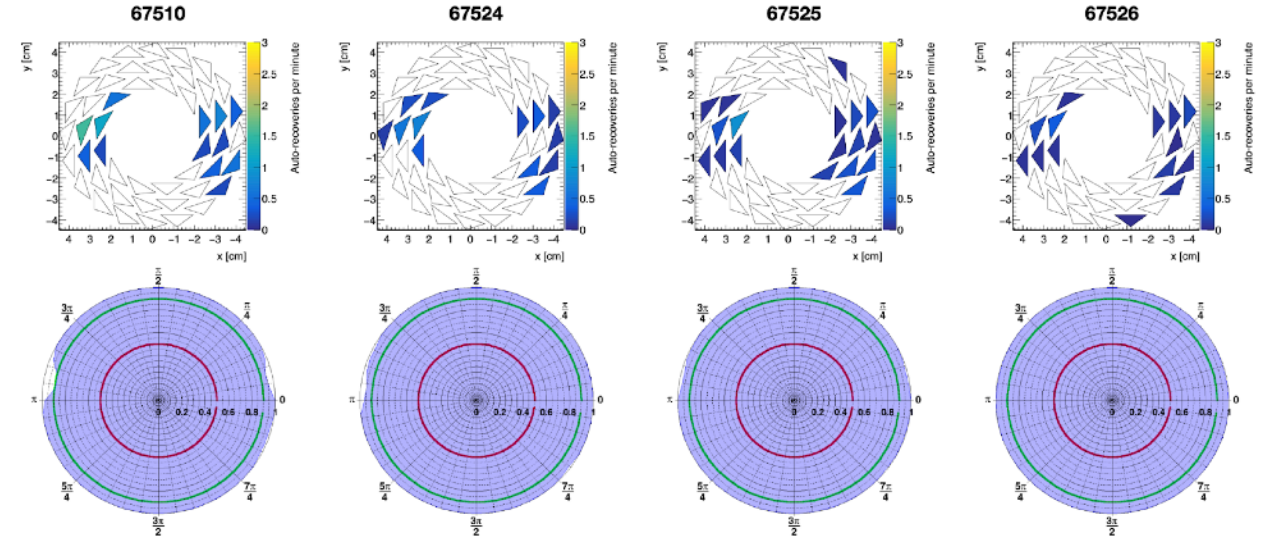


Streaming

3

111x111 collisions

June 15th; **Triggered mode**; run 67510 ~ 67526 (67526 is 1-hour run)



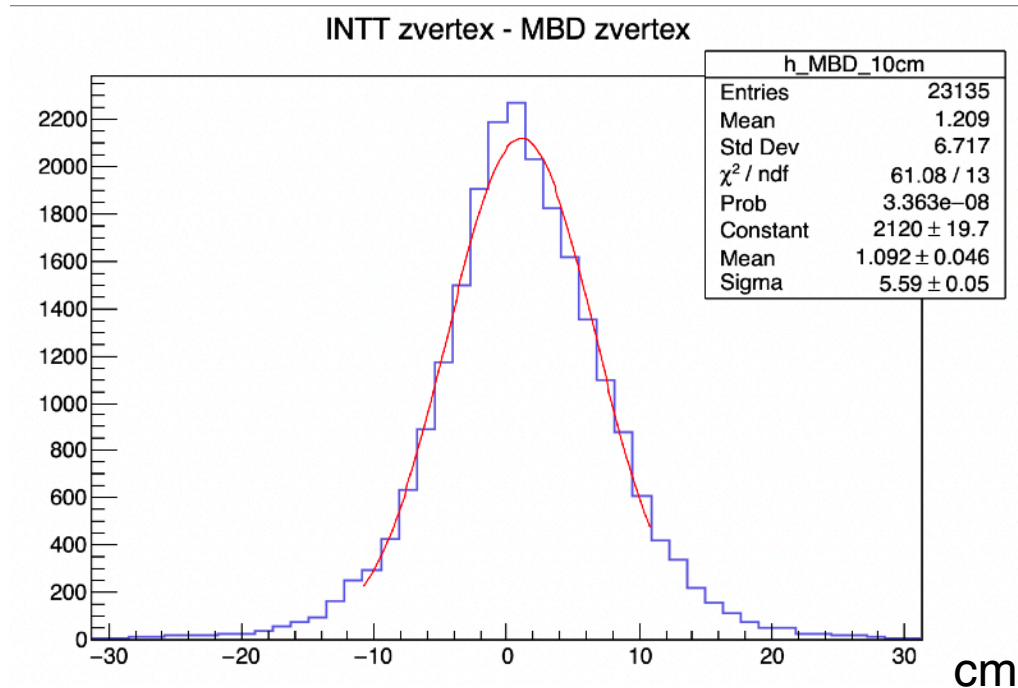
Trigger

2

MVTX groups conclude MVTX is operating in Trigger mode with 111x111 bunches
Plot here show MVTX acceptance based auto-recovery late in both streaming mode / Trigger mode

INTT - MBD Vertex correlation

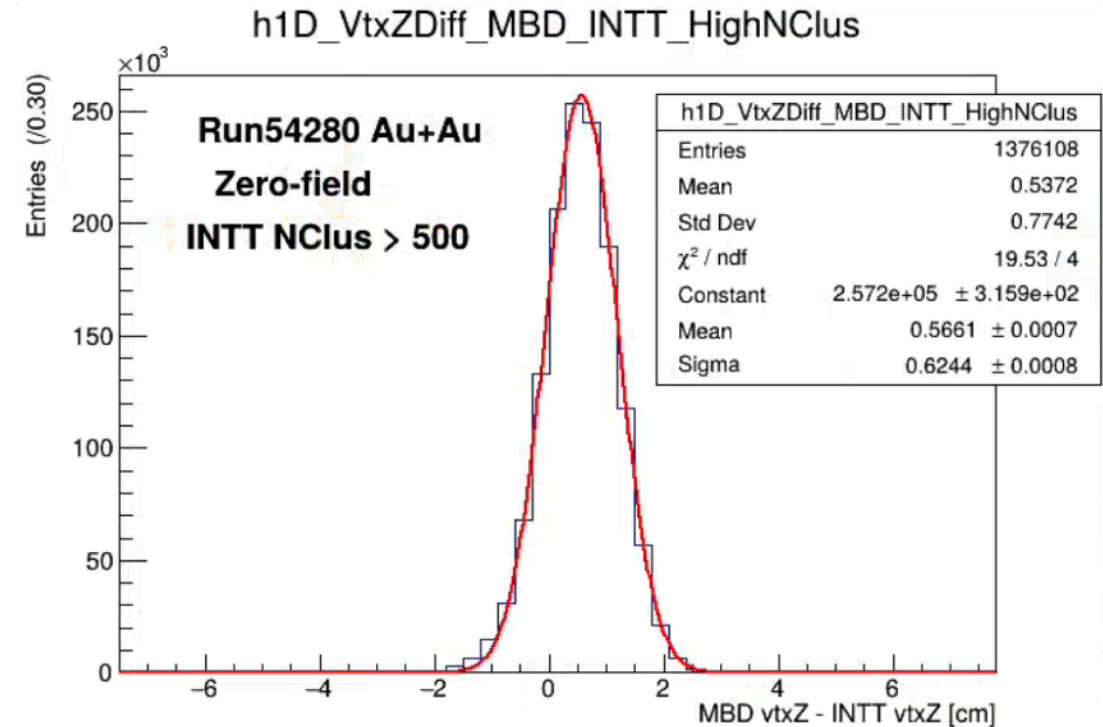
Mahiro showed at SCM (June 17)
INTT Zvertex - MBD Zvertex



Result shows nice agreement between INTT and MBD, but the width is larger than original expectation

- Only shows the low multiplicity events
- With Magnetic field ON

Cheng-Wei's last year 0-field run result

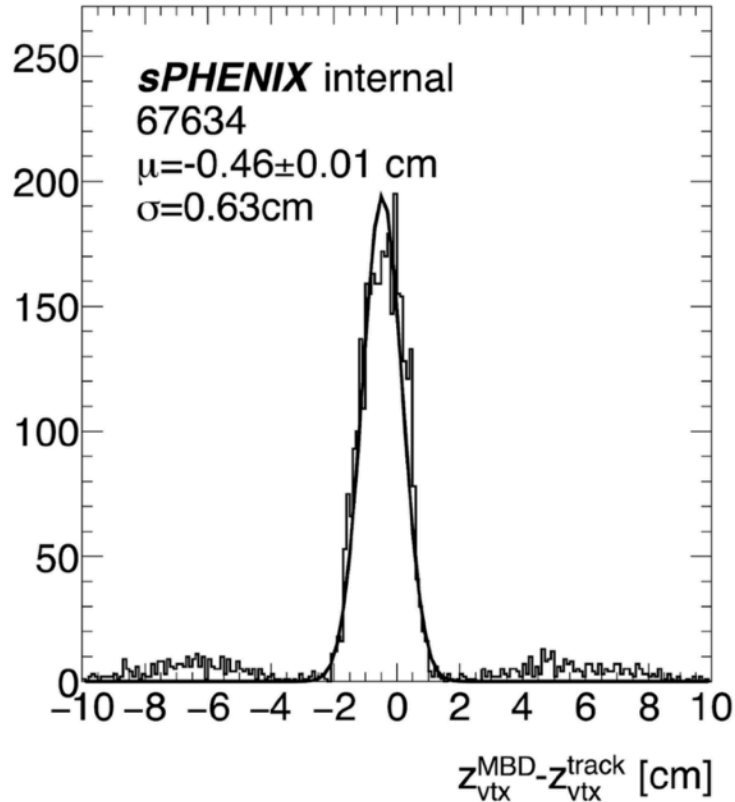


sPHENIX people tried to understand MBD resolution with other subsystem, necessary for MBD z-vertex calibration!

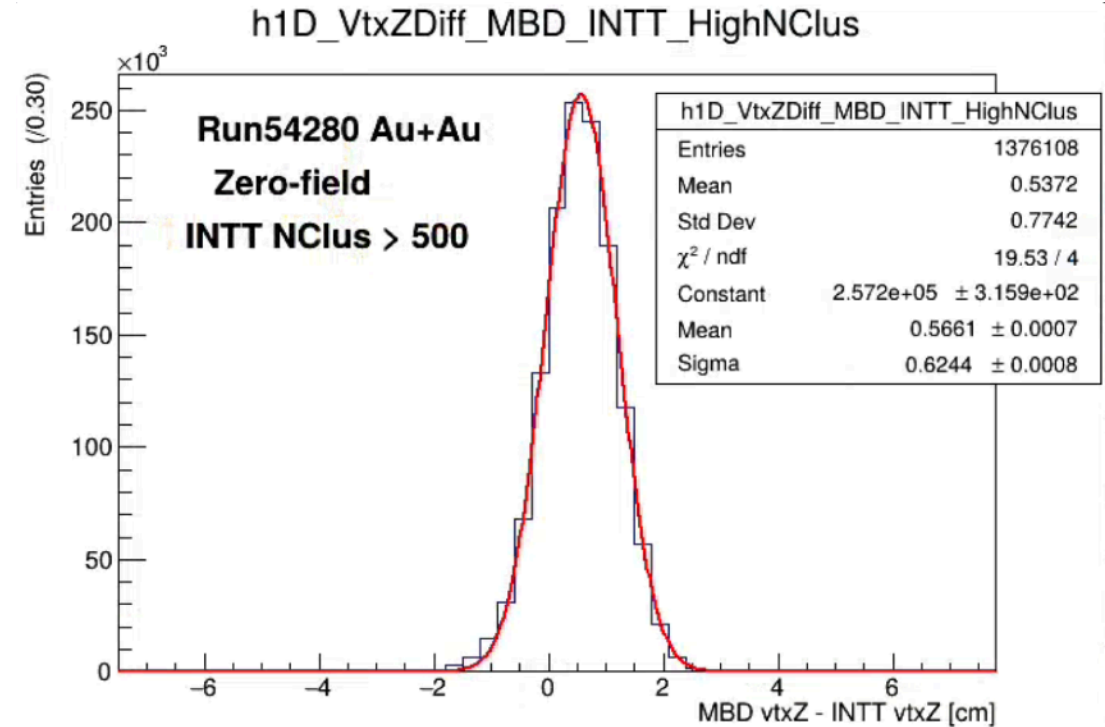
But we have MVTX now! - Moving to check with FULL Tracker

INTT - MBD Vertex correlation

Joe Osborn showed at SCM (June 18)
Track Zvertex - MBD Zvertex

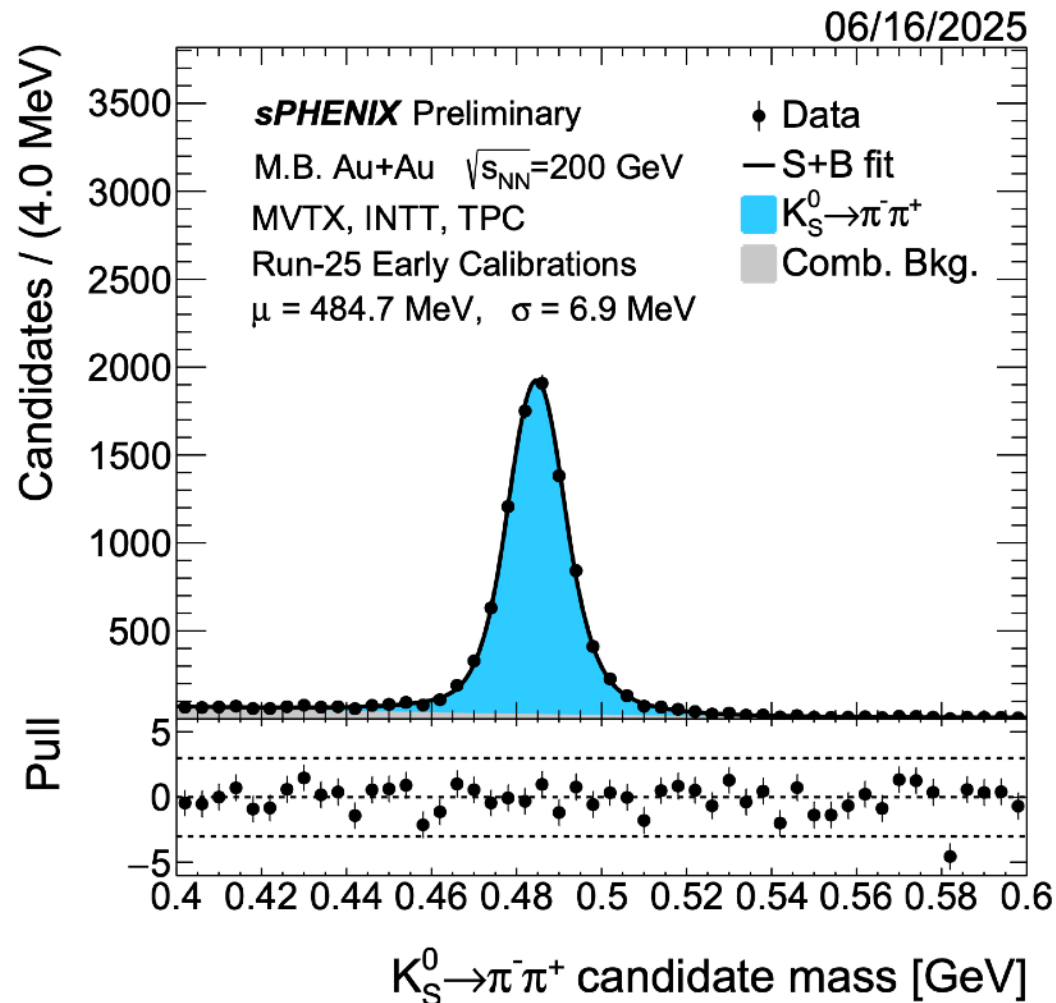
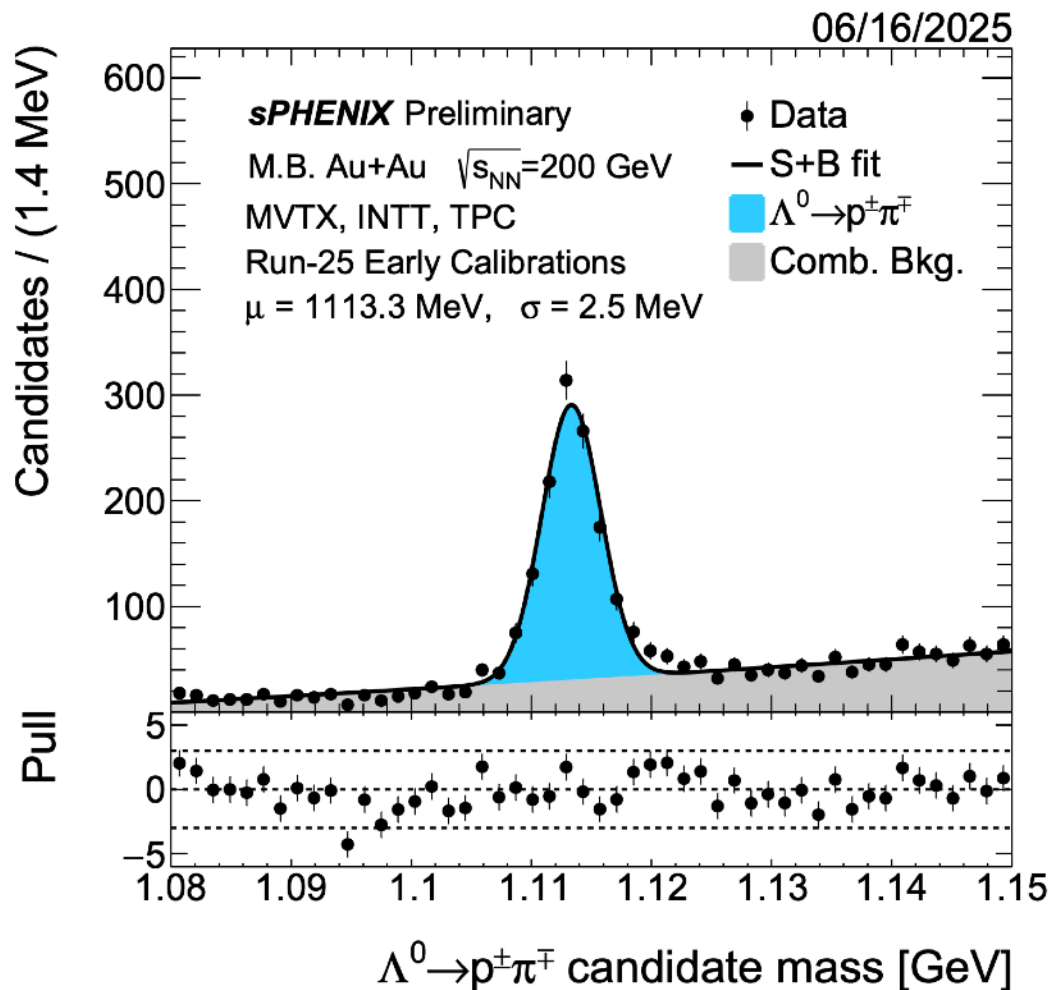


Cheng-Wei's last year 0-field run result



Both results support MBD resolution at AuAu is ~ 0.63 cm! Urgent issue related to Z-vertex has been addressed
Less pressure on INTT, but better to understand current data with INTT Z-vertex only especially with Field ON

Full Tracker Result has been released from this year AuAu data - First resonance from AuAu by Tracker



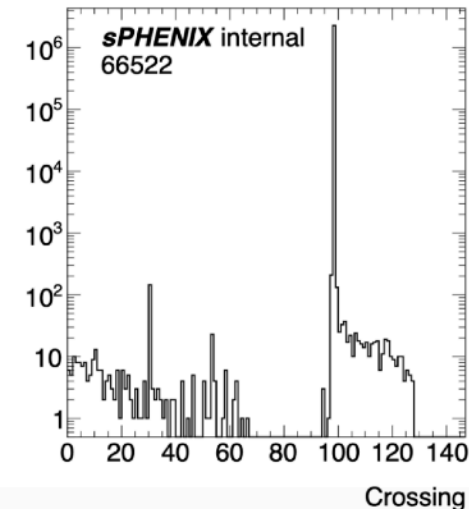
We are in charge on INTT calibration for full tracker systems

Slides from Joe

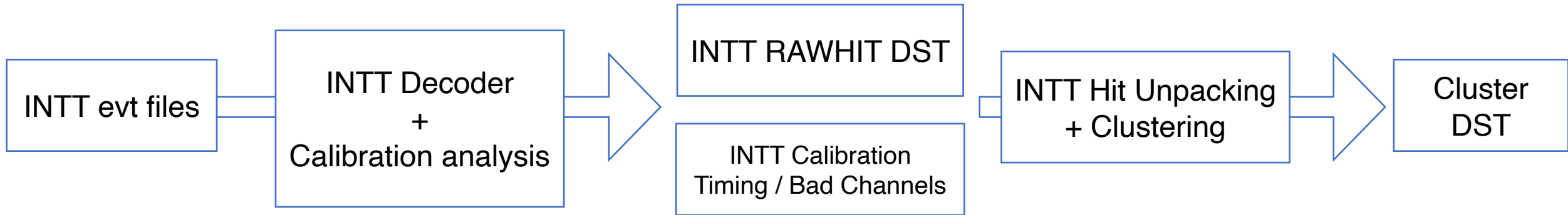
Track Fitter

- `pp_mode==false` has this criteria
- INTT is not timing calibrated! Crossing is almost always not 0
 - Discussed with Jaein. We need to integrate an INTT timing calibration module into the production of raw hits, after which the calibration will be produced automatically
- Running in `pp_mode` is also potentially an option. But that will not solve this problem because the crossing number is “wrong”, so the TPC clusters would be moved in z by the wrong amount
- Solution - just set crossing and `crossing_estimate == 0`
 - Will introduce some background, but the seed crossing distribution suggests it is very small right now

```
else
{
    // non pp mode, we want only crossing zero, veto others
    if(siseed && silicon_crossing != 0)
    {
        continue;
    }
    crossing_estimate = crossing;
}
```



Joe and myself are working on making timing/bad channel map calibration automatically(Ongoing)



Discussion with production team;
ex) How to implement/ management of the CDBTTree...etc..

But we need to provide BadChannel map / Timing CDB ASAP for current data set
Now, we are in Trigger mode. Tracking group cannot do timing analysis based on INTT before we provide the timing calibration

Takahiro is working on producing BadChan/Timing calibration CDB from current runs

Scan for Chip saturation study - data taking done by Ryotaro / Takahiro

1	Date/Time	Run#	Run Type	Mag	Link	L1 Delay	n_coll	open time	Modebit	Comments
87	2025/6/15 10:43	67541	beam	On	plot	35	108	100	60	Coming Again Custom DigCon
88	2025/6/15 13:09	67542	beam	On	plot	35	108	100	127	From here: INTT saturation study / Changing n_coll and open_time
89	2025/6/15 13:14	67543	beam	On	plot	35	108	2	60	data check: the plateau width changed properly
90	2025/6/15 13:16	67544	beam	On	plot	35	108	100	110	
91	2025/6/15 13:22	67545	beam	On	plot	35	108	100	90	
92	2025/6/15 13:27	67546	beam	On	plot	35	108	100	80	
93	2025/6/15 13:33	67547	beam	On	plot	35	108	100	60	
94	2025/6/15 13:39	67548	beam	On	plot	35	108	100	40	
95	2025/6/15 13:45	67549	beam	On	plot	35	108	100	25	
96	2025/6/15 13:51	67550	beam	On	plot	35	108	2	127	Intt2, fee04; timing misaligned (from this run)?
97	2025/6/15 13:59	67552	beam	On	plot	35	108	2	110	Global DAQ started another run between this and the previous run. Intt2, fee04; timing misaligned?
98	2025/6/15 14:04	67553	beam	On	plot	35	108	2	90	Intt2, fee04; timing misaligned?
99	2025/6/15 14:10	67554	beam	On	plot	35	108	2	80	Intt2, fee04; timing misaligned?
100	2025/6/15 14:16	67555	beam	On	plot	35	108	2	60	Intt2, fee04; timing misaligned?
101	2025/6/15 14:22	67556	beam	On	plot	35	108	2	40	Intt2, fee04; timing misaligned?
102	2025/6/15 14:28	67557	beam	On	plot	35	108	2	25	Intt2, fee04; timing misaligned?
103	2025/6/15 14:34	67558	beam	On	plot	35	108	50	127	Intt2, fee04; the hit map shows more hits, but not sure if it's recovered. We cannot tell by eye.
104	2025/6/15 14:40	67559	beam	On	plot	35	108	50	110	
105	2025/6/15 14:46	67560	beam	On	plot	35	108	50	90	
106	2025/6/15 14:52	67561	beam	On	plot	35	108	50	80	junk? No signal in intt0 south
107	2025/6/15 14:59	67563	beam	On	plot	35	108	50	60	Global DAQ started another run between this and the previous run. Intt0 south came back (!).
108	2025/6/15 15:06	67564	beam	On	plot	35	108	50	40	
109	2025/6/15 15:10	67565	beam	On	plot	35	108	50	25	
110	2025/6/15 15:16	67566	beam	On	plot	35	108	50	80	retake of run 67561

Remaining Scanning programs

- Data for Hit Carry over issue check

Task	Person in Charge	Duration	Points	Beam condition	Other subsystem	Priority	Field	Trigger	
Carried over hit study	DAQ: 1008 guys Analysis: Ryotaro Support: Cheng-Wei	30 mins	INTT in trigger mode moderate open_time (80 or 128) ncollision 1 or 2 or 3 Short GTM busy window for this test	with collisions (with high rate)	With MBD, in global mode	High	Any	MBD	

- Chip by chip Digital Control Test - Trying to recover Half Entry chips
- We need **LIST OF CHIPS** has half entry issue from current run (analysis from current run required)
- Change Digital Control for half entry chips and see if we can recover them..

- Update Online bad channel map (Taking data without any masking)

Task	Person in Charge	Duration	Points	Beam condition	Other subsystem	Priority	Field	Trigger	
Renew chip/channel mask	DAQ: 1008 guys Analysis: Jaein Support: Rachid/Raul	1 min w/ FA	Need some iterations	With collisions	Standalone	Must	Any	Any	

- **Many tasks quickly handled by onsite INTT members**
(Genki, Ryotaro, Takahiro, Itsuka, Mahiro, Jaein)
- **MVTX is working well in trigger mode**
 - **MBD calibration with full tracker possible / Au+Au resonance signal has been observed and released!**
- **Timing calibration** needs to be automated (in progress)
- **Run 25 data calibration** is ongoing (Led by Takahiro)
- **Some scanning programs remain**
 - Would be great to **finalize INTT scanning** for **100% data-taking readiness**
- **Encouragement for offsite people to take a look at Run 25 Au+Au data**
 - This is real **PHYSICS** data!
 - Your quick feedback helps **build confidence on our data** and catch potential issues early