

Data preparation for Ryota

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Ryota needs data

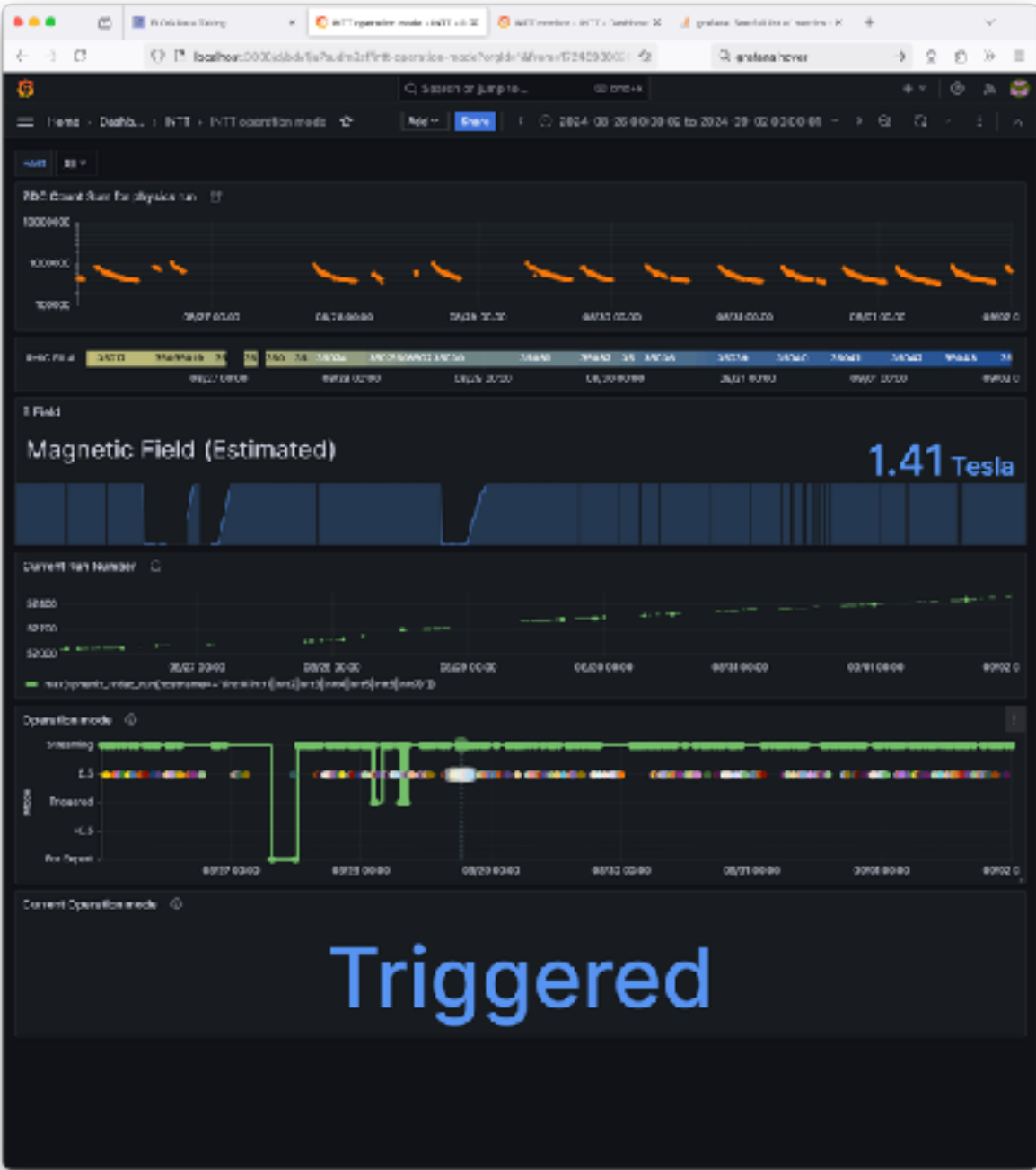
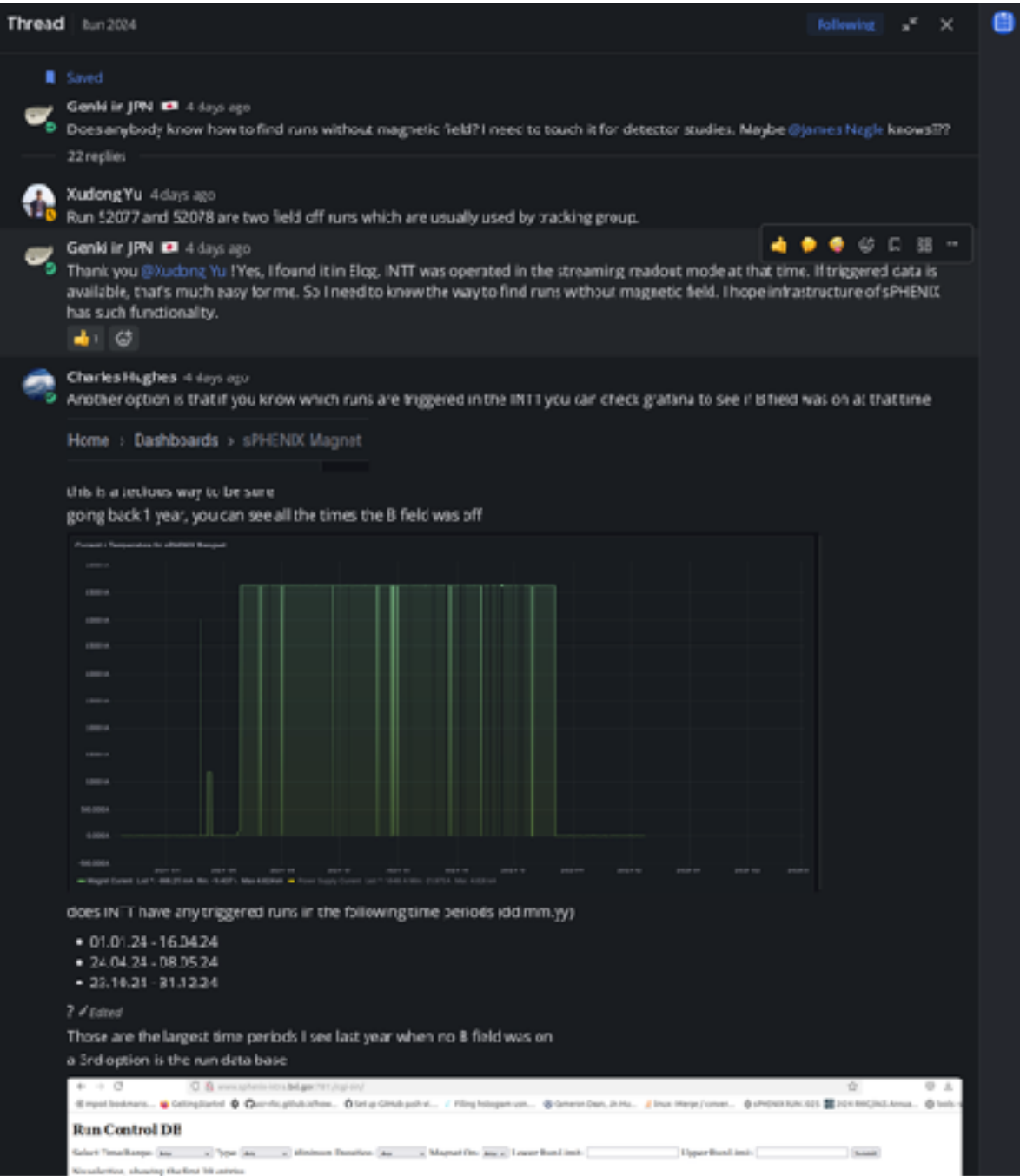
- Ryota studies INTT detection performance to show the results at JPS meeting.
- pp collision data without magnetic field is needed for the study.
- Do we have it?

Searching INTT pp data without magnetic field

- There is no perfect method of run search. I needed to check multiple places/methods
 - Elog: if the shifters write correctly....
 - DAQ database: magnet_info table looks good, but there is no document about it. If I see inside the table, some runs without magnetic field were found, but the runs found in Elog were not found in the table. Is it reliable?
 - Grafana: Graphical check is also good.
- After the discussion on Mattermost, I think the mothods above are all ways to search runs.
- Conclusion after lots of effort: run 52077 and 52078

```
oac-> SELECT * FROM run INNER JOIN magnet_info ON run.runnumber = magnet_info.runnumber WHERE magnet_info.magnet_on = false;
```

runnumber	runtype	starttimestamp	endtimestamp	updatetimestamp	eventsinrun	marked_invalid	has_comment	qcomment	runnumber	current	magnet_on
46831	junk	2024-06-19 11:30:12	2024-06-19 11:31:38		22	-1	0		46831	4.2/949920e+87	f
46254	junk	2024-06-20 14:10:55	2024-06-20 14:21:09		6176661	-1	0		46254	4.2/89440e+87	f
46389	junk	2024-06-20 23:06:59	2024-06-20 23:07:47		173417	-1	0		46389	4.2/892840e+87	f
46401	physics	2024-06-22 20:51:39	2024-06-22 21:42:10		25745373	-1	0		46401	4.289528e+87	f
46039	junk	2024-06-27 07:12:15	2024-06-27 07:13:02		519681	-1	0		46039	4.916517e+86	f
46039	junk	2024-06-27 07:18:10	2024-06-27 07:19:02		615992	-1	0		46039	7.901228e+86	f
46040	junk	2024-06-27 07:29:09	2024-06-27 07:30:53		17	-1	0		46040	1.1999208e+87	f
49403	junk	2024-07-29 13:12:15	2024-07-29 13:14:11		95397	-1	0		49403	1.44867	f
49404	junk	2024-07-29 13:14:44	2024-07-29 13:15:05		11948	-1	0		49404	1.575927e+86	f
49405	junk	2024-07-29 13:16:24	2024-07-29 13:16:45		7204	-1	0		49405	2.574119e+86	f
49406	junk	2024-07-29 13:18:38	2024-07-29 13:18:55		9529	-1	0		49406	3.899875e+86	f
49407	junk	2024-07-29 13:19:47	2024-07-29 13:20:07		14695	-1	0		49407	4.538151e+86	f
49408	junk	2024-07-29 13:26:37	2024-07-29 13:27:13		49396	-1	0		49408	6.366959e+86	f
49409	junk	2024-07-29 13:53:52	2024-07-29 13:53:37		56501	-1	0		49409	1.4847864e+87	f
49498	junk	2024-07-29 14:53:52	2024-07-29 14:14:07		191776	-1	0		49498	1.5457804e+87	f
49491	junk	2024-07-29 14:17:36	2024-07-29 14:27:46		182671	-1	0		49491	2.5441612e+87	f
49492	junk	2024-07-29 14:28:20	2024-07-29 14:36:39		87006	-1	0		49492	2.981554e+87	f
49493	junk	2024-07-29 14:39:10	2024-07-29 14:48:37		95214	-1	0		49493	3.451270e+87	f
49494	junk	2024-07-29 14:51:04	2024-07-29 15:01:34		186140	-1	0		49494	3.978156e+87	f
49777	junk	2024-07-31 09:54:50	2024-07-31 09:56:08		6047	-1	0		49777	2.25787	f
49826	junk	2024-07-31 14:55:30	2024-07-31 14:57:07		638793	1	0		49826	1.9902958e+87	f
49827	junk	2024-07-31 15:00:23	2024-07-31 15:04:51		3731266	1	0		49827	2.2188994e+87	f
49828	junk	2024-07-31 15:07:46	2024-07-31 15:53:00		18866768	1	0		49828	2.6522474e+87	f
52234	junk	2024-08-28 14:12:19	2024-08-28 14:12:53		6593	1	0		52234	2.639811e+86	f
52253	junk	2024-08-28 15:49:34	2024-08-28 16:09:15		117655	1	0		52253	2.9818356e+87	f
55369	cosmics	2024-10-27 21:53:23	2024-10-27 22:51:11		234937	1	0		55369	2816	f
55369	cosmics	2024-10-28 22:18:21	2024-10-28 22:42:03		8197826	1	0		55369	388	f
55378	cosmics	2024-10-28 22:44:26	2024-10-28 23:43:51		20279214	1	0		55378	468	f
(28 rows)											



INTT pp data without magnetic field

- Run: 52077 and 52078
- Data: Aug/26/2024
- No magnetic field due to magnet failure
- 6 x 6 fill
- *INTT was in the streaming readout mode*

Run 2025 Log Run 2024 Log Data Taking Run 2023 Log Run 2023 Shift Checklist IICAI FMCAI TPC TPOT MVTX INTT MND DDOSTest DAQ		
Data Taking Logbook		
⏪ ⏩ ⏴ ⏵ List New Edit Delete Reply Duplicate Find Config Help		
Message ID: 580 Entry time: Mon Aug 26 08:01:50 2024		
Author:	Thomas Marshall	
Subject:	August 26, 2024 Day Shift	
Run:		
Run Number	Reason to End	Notes
52076	Starting physics	Junk run at beginning of store
52077	1 hr running!	Physics run, 9.0 kHz set rate w/ rare event triggers (6.5 kHz actual rate), sPHENIX magnet off, all detectors in, 6x6 store, 0.6 kHz ZDC • 6x6, B-field = 0 T (or low field - ask @Kin Yip.) • physics triggers • trigger rate = 6.43 kHz • ZDC coin. rate = N/A • MBD coin. rate = 40.5 kHz • ZS - @Christopher Platte's threshold tuning, #pre_samp=0, #post_samp=0, 1023 sample per trigger, compression enabled • GEM HV = 3.35 kV weather eq. • Diffuse Laser = 3 MIP at 95 Hz
52078	Beam unexpectedly dumped in the middle of the run (~30 min of data taking before then)	Physics run, 9.0 kHz set rate w/ rare event triggers (7.5 kHz actual rate), sPHENIX magnet off, all detectors in, 6x6 store, 450 Hz ZDC • 6x6, B field = 0 T (or low field - ask @Kin Yip.) • physics triggers • trigger rate = 7.49 kHz • ZDC coin rate = 400-500 Hz • MND coin. rate = 31.1 kHz • ZS - @Christopher Platte's threshold tuning, #pre_samp=0, #post_samp=0, 1023 sample per trigger, compression enabled • GEM HV = 3.35 kV weather eq. • Diffuse Laser = 3 MIP at 95 Hz

INTT streaming data for detection performance study

- Triggered data is preferable for detection performance study, but not available...
- Hits from multiple collisions are in one Fun4All event.
 - Hits for 5 RHIC turns = 5 INTT strobes are in one Fun4All event in the official DSTs.
- As we performed in Sep/2024, we can find hits at the trigger timing.
- sPHENIX software was updated since Sep., so some new features can be used:
 - TrkrClusterHitAssoc: association b/w clusters and hits
 - TrkrClusterCrossingAssoc: association b/w cluster and crossing
 - time bucket of TrkrHit and TrkrClusters
- I tried to use them to find TrkrClusters taken at the timing of trigger but needed more time. Because we are in a rush, I made a stupid way.

```
List of Nodes in Fun4AllServer:
Node Tree under TopNode TOP
TOP (PHCompositeNode)/
  DST (PHCompositeNode)/
    GL1 (PHCompositeNode)/
      GL1RAWHIT (IO,Gl1Packetv2)
    INTT (PHCompositeNode)/
      INTTRAWHIT (IO,InttRawHitContainerv2)
      INTTEVENTHEADER (IO,InttEventInfov1)
      G4HIT_INTT (IO,PHG4HitContainer)
    MVTX (PHCompositeNode)/
      MVTXRAWVTHEADER (IO,MvtxRawEvtHeaderv2)
      MVTXRAWHIT (IO,MvtxRawHitContainerv1)
      G4HIT_MVTX (IO,PHG4HitContainer)
    TPC (PHCompositeNode)/
      TPCRAWHIT (IO,TpcRawHitContainerv2)
      G4HIT_TPC (IO,PHG4HitContainer)
    MICROMEGAS (PHCompositeNode)/
      MICROMEGASRAWHIT (IO,MicromegasRawHitContainerv1)
      G4HIT_MICROMEGAS (IO,PHG4HitContainer)
    Sync (IO,SyncObjectv1)
    EventHeader (IO,EventHeaderv1)
    TRKR (PHCompositeNode)/
      TRKR_HITSET (IO,TrkrHitSetContainerv1)
      TRKR_CLUSTER (IO,TrkrClusterContainerv4)
      TRKR_CLUSTERHITASSOC (IO,TrkrClusterHitAssocv3)
      TRKR_CLUSTERCROSSINGASSOC (IO,TrkrClusterCrossingAssocv1)
    G4TruthInfo (IO,PHG4TruthInfoContainer)
```

INTT streaming data for detection performance study

TrkrCluster

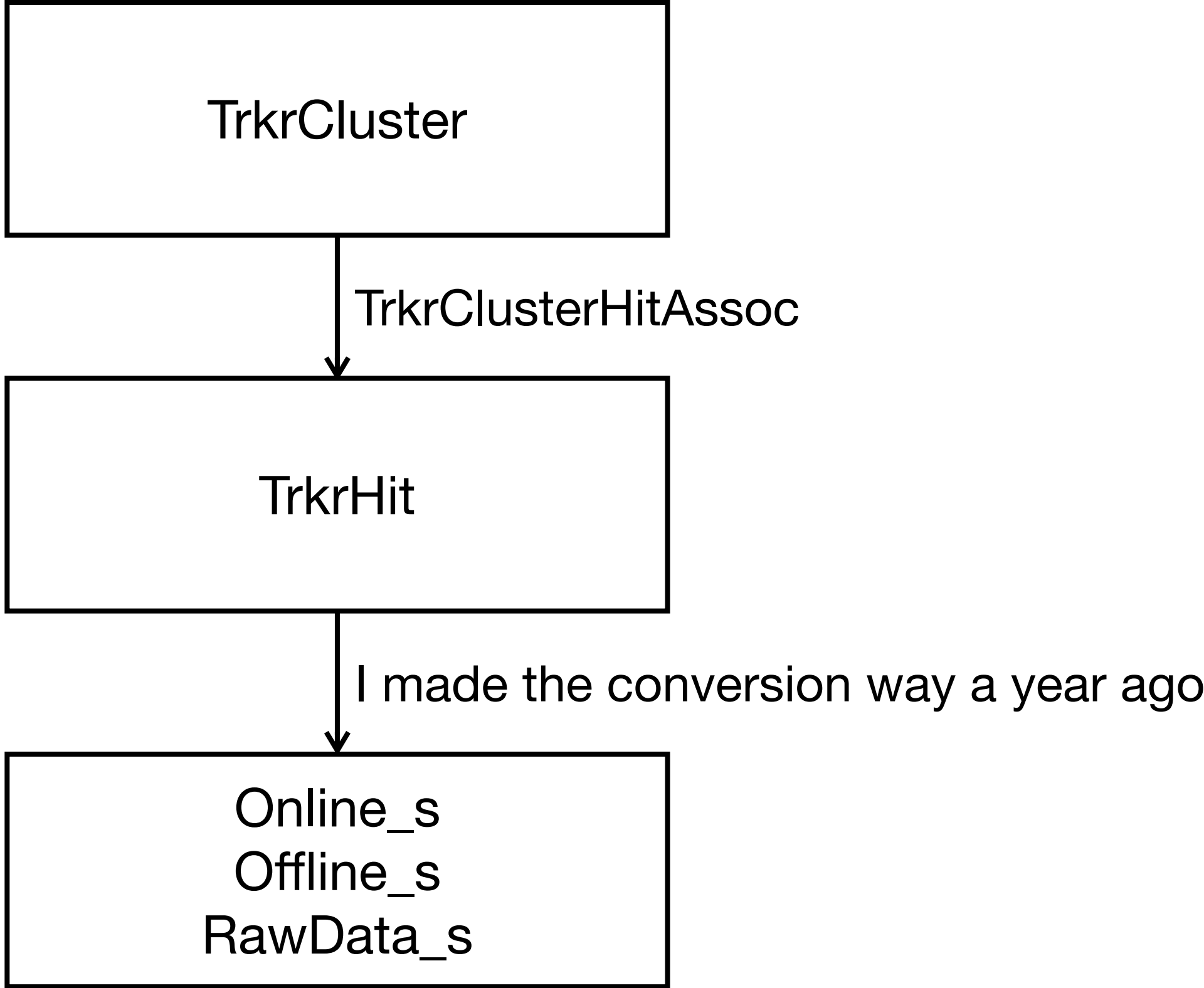
INTT streaming data for detection performance study



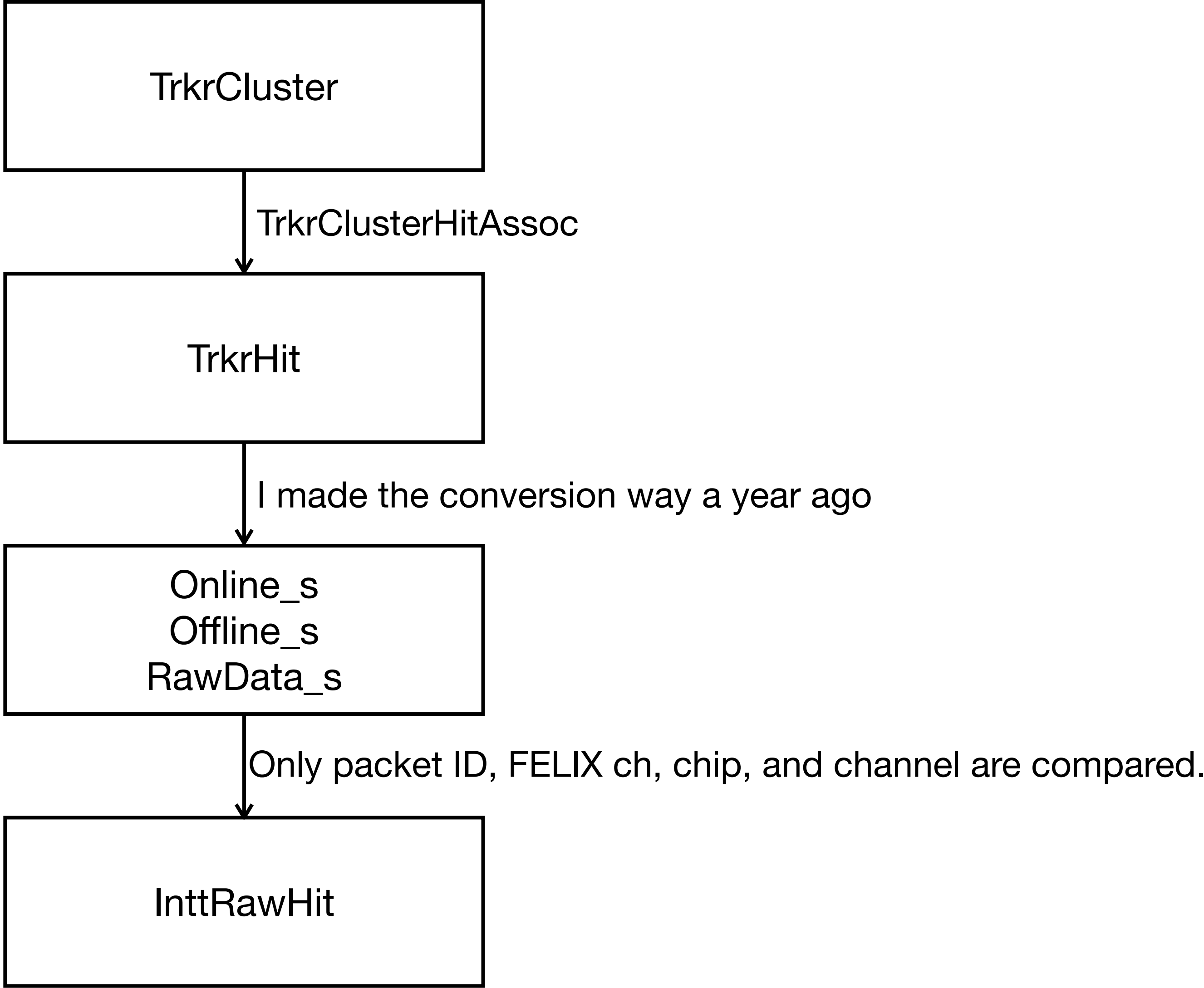
TrkrClusterHitAssoc



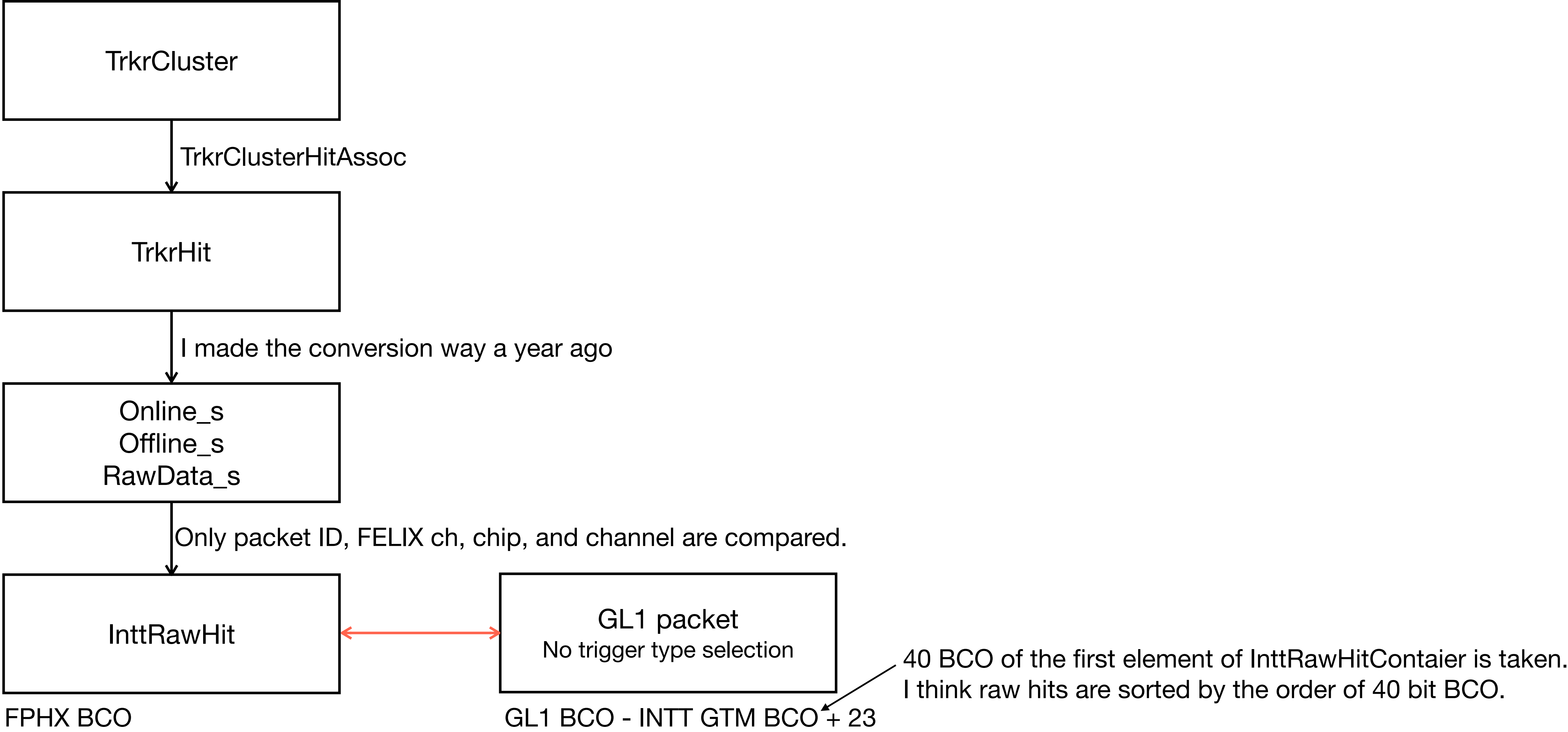
INTT streaming data for detection performance study



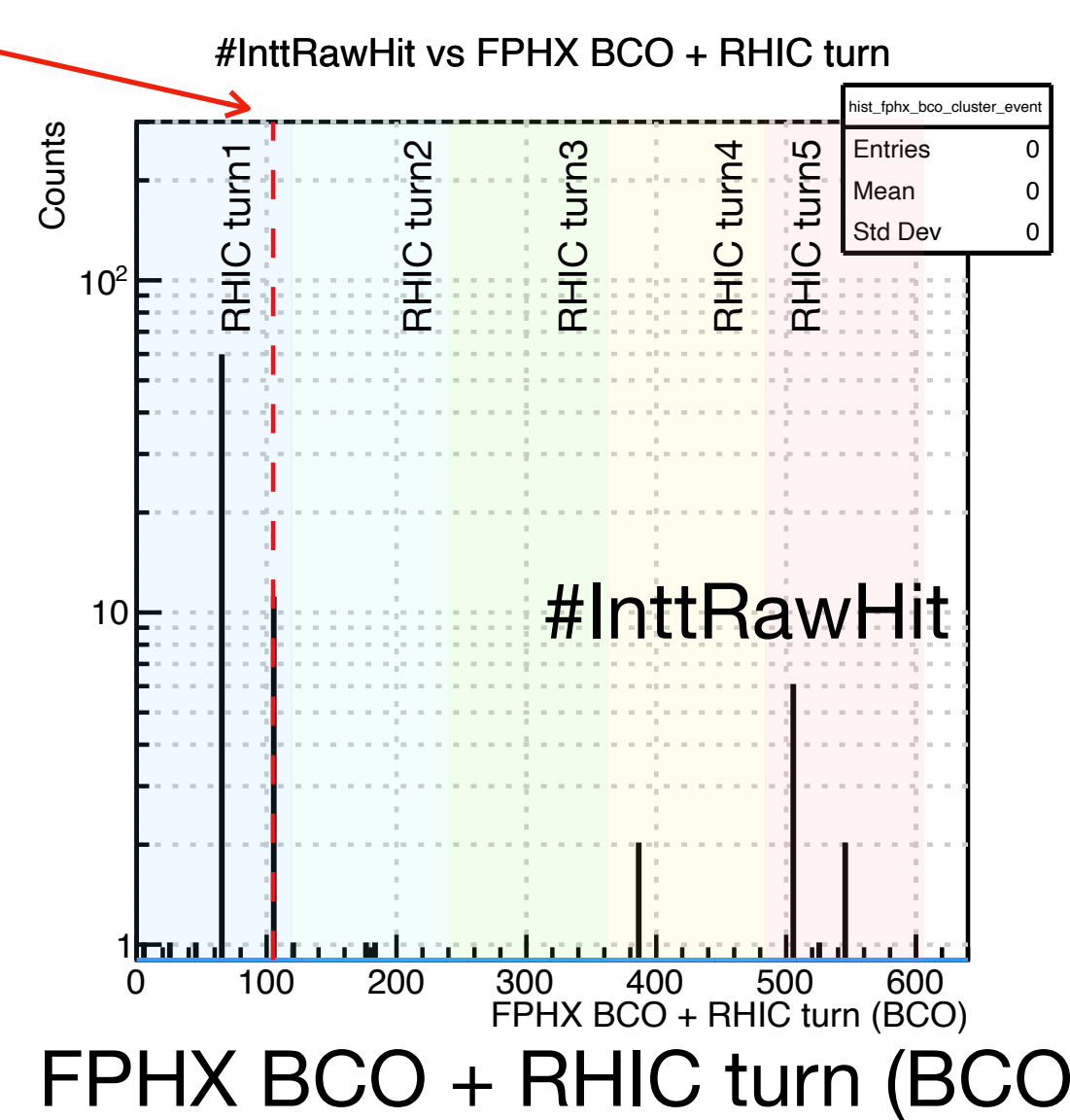
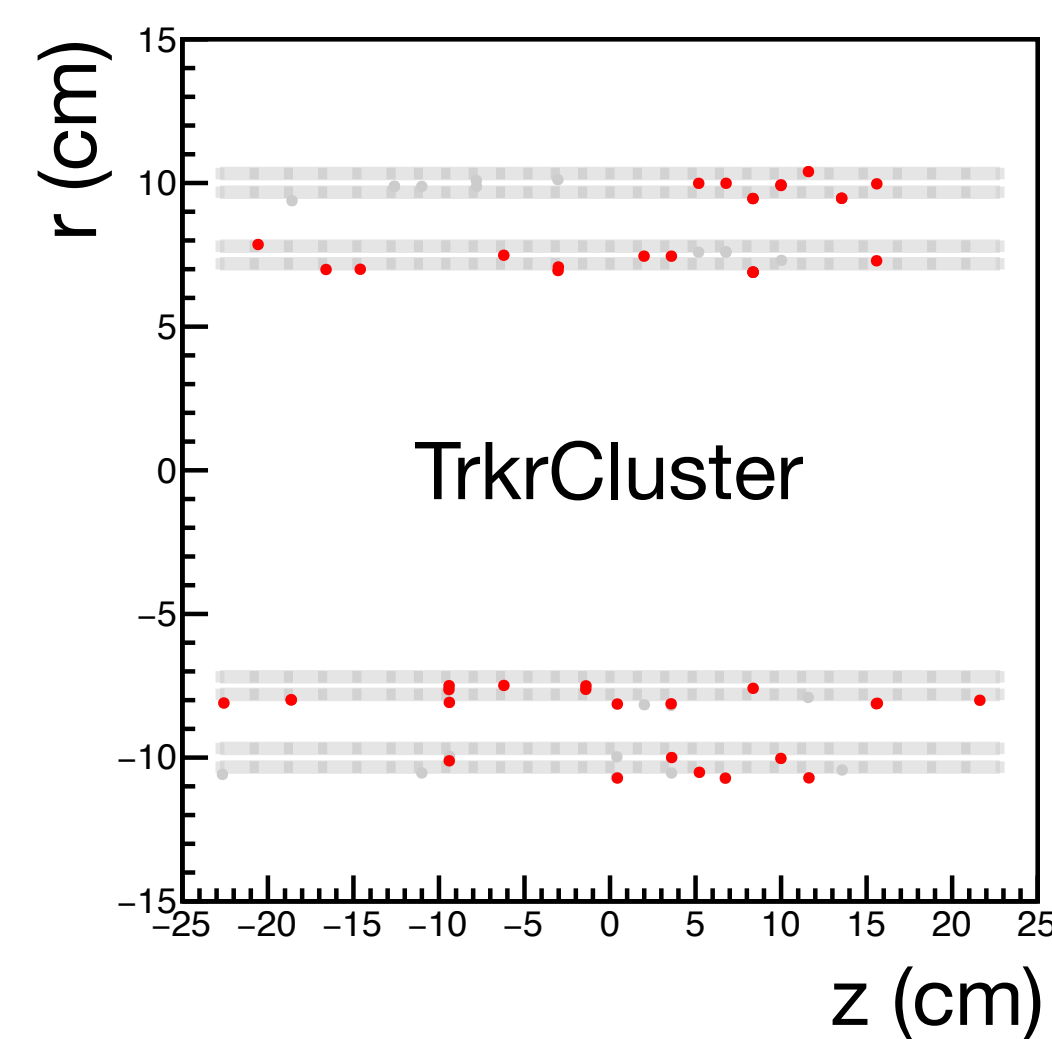
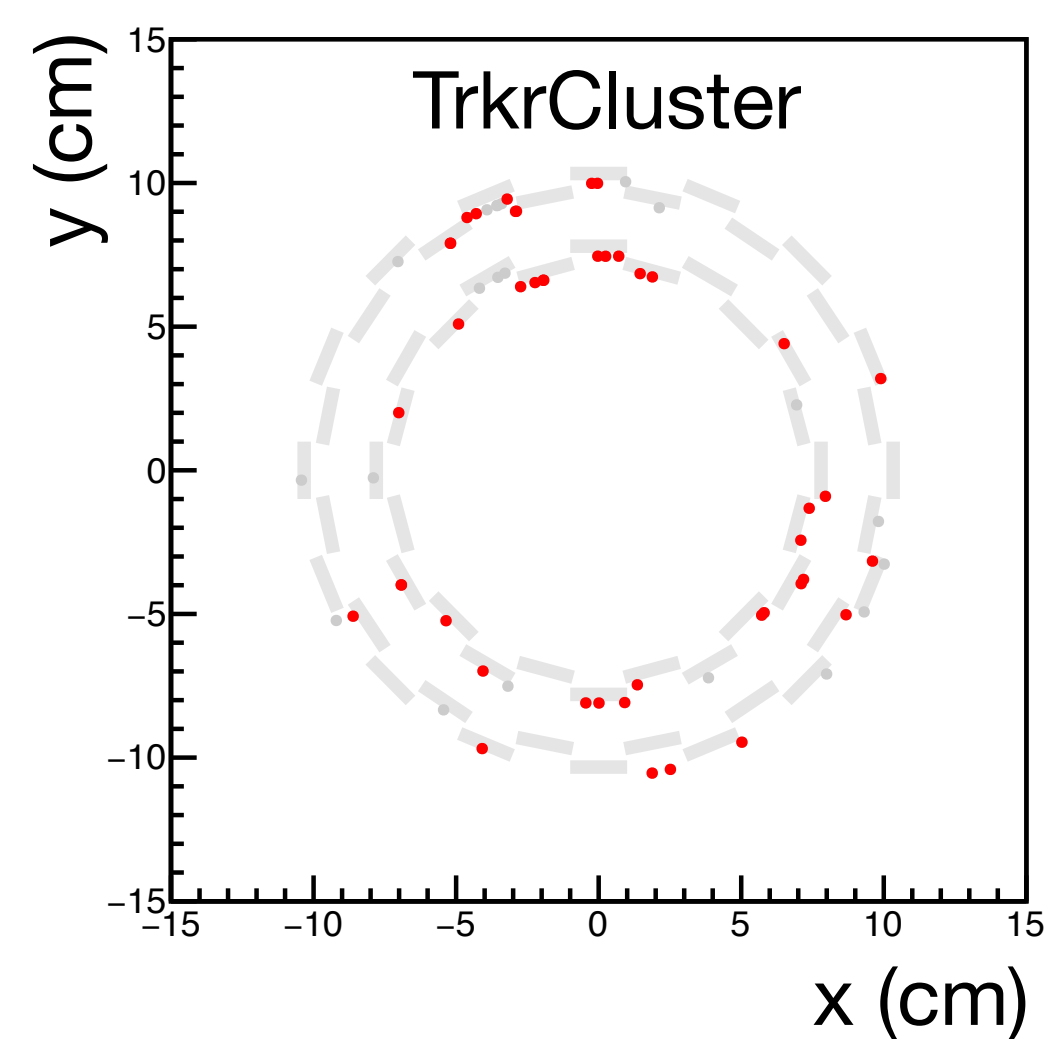
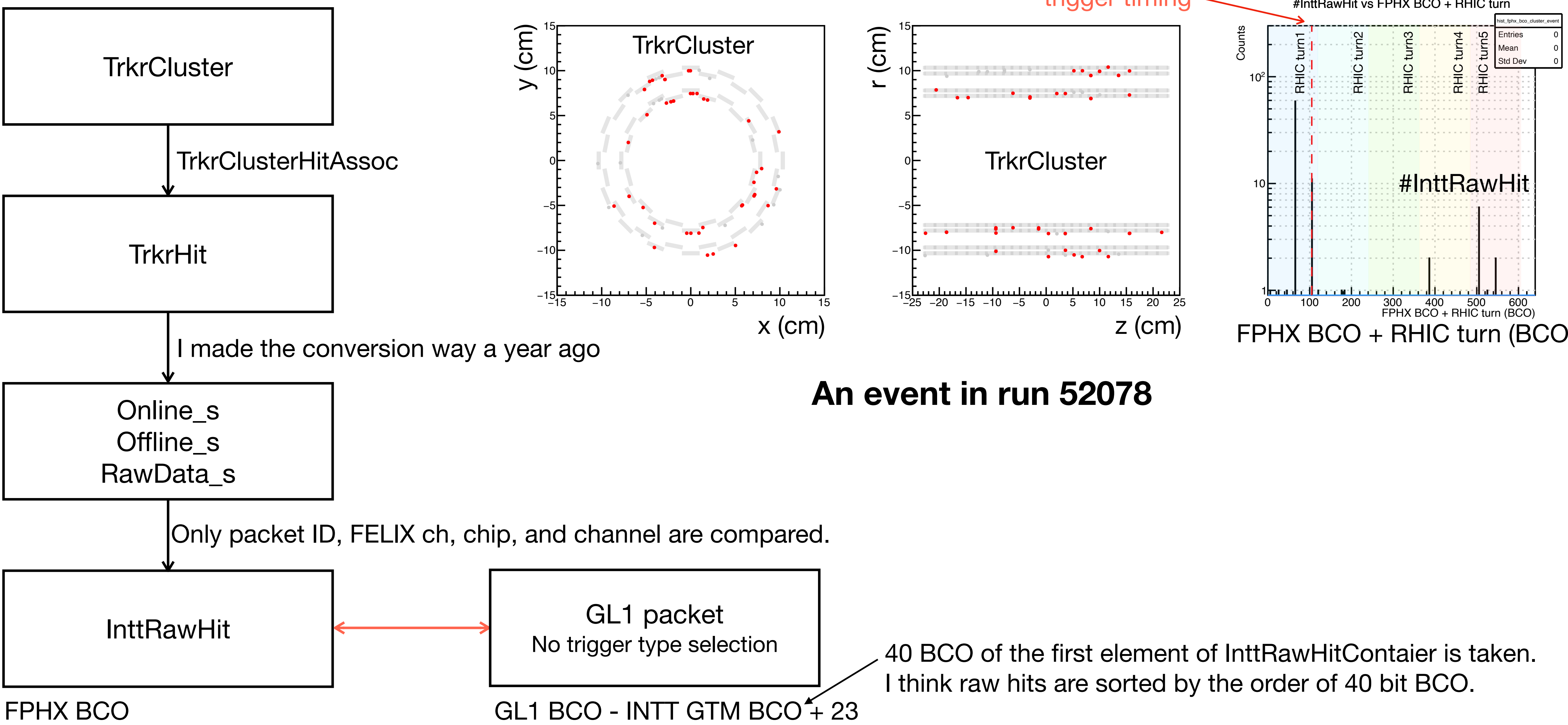
INTT streaming data for detection performance study



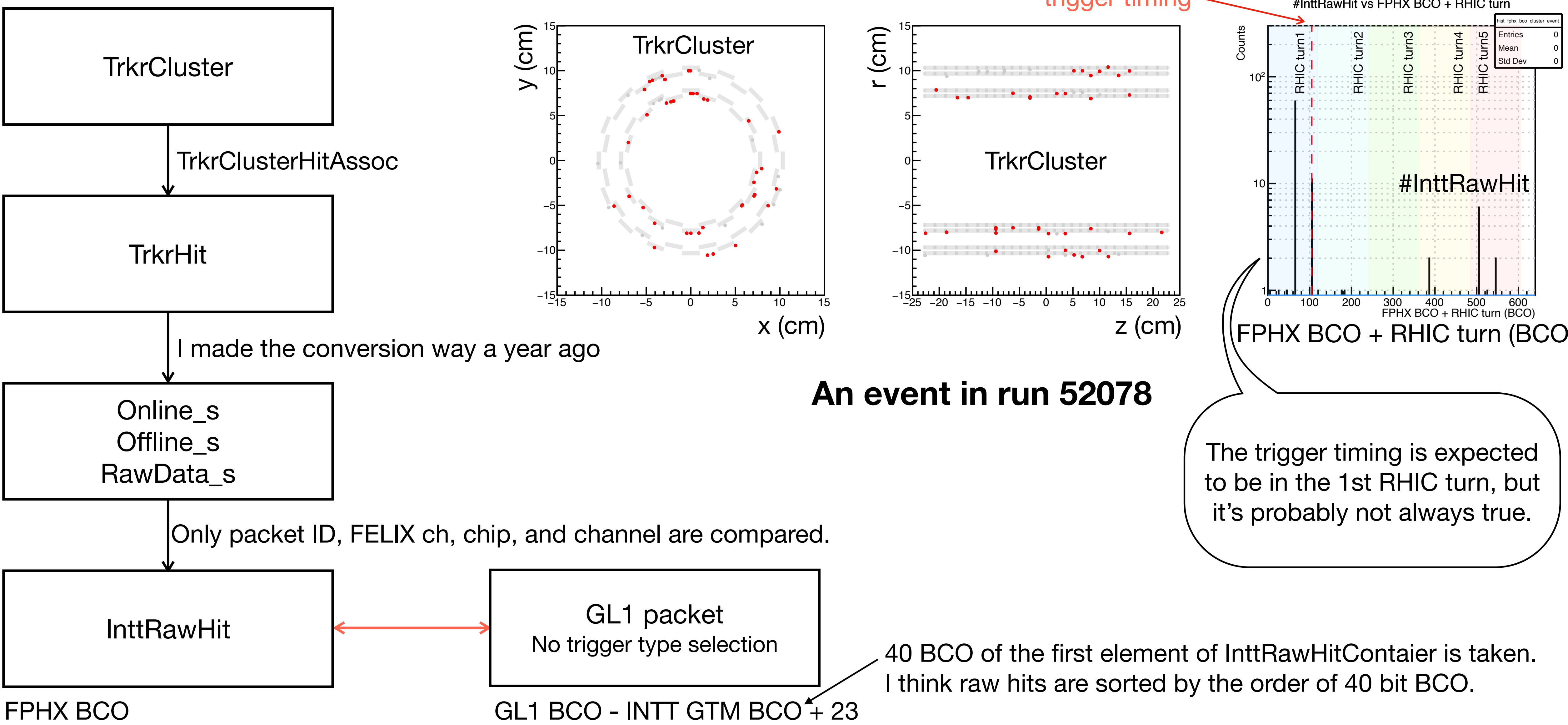
INTT streaming data for detection performance study



INTT streaming data for detection performance study



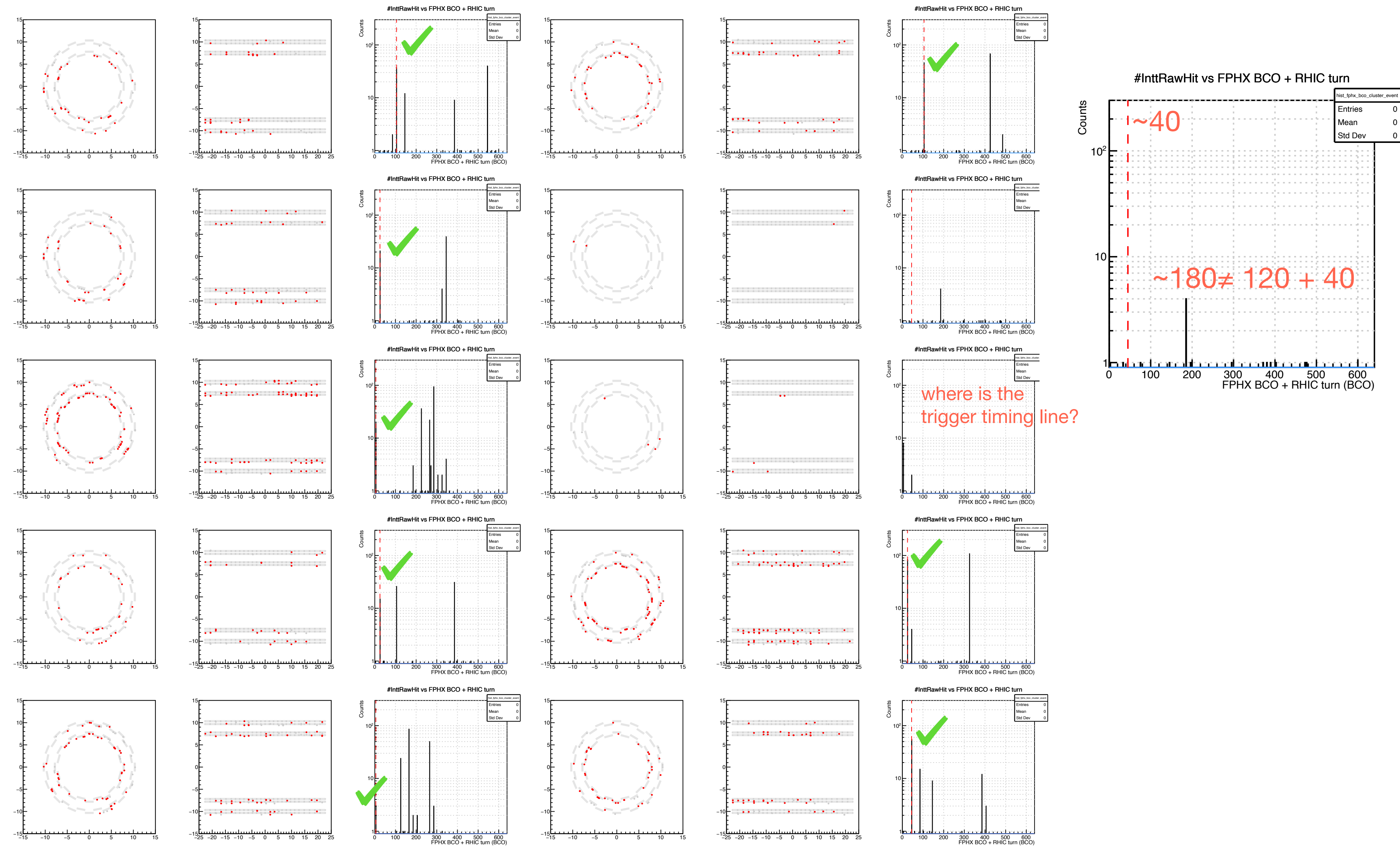
INTT streaming data for detection performance study



An event in run 52078

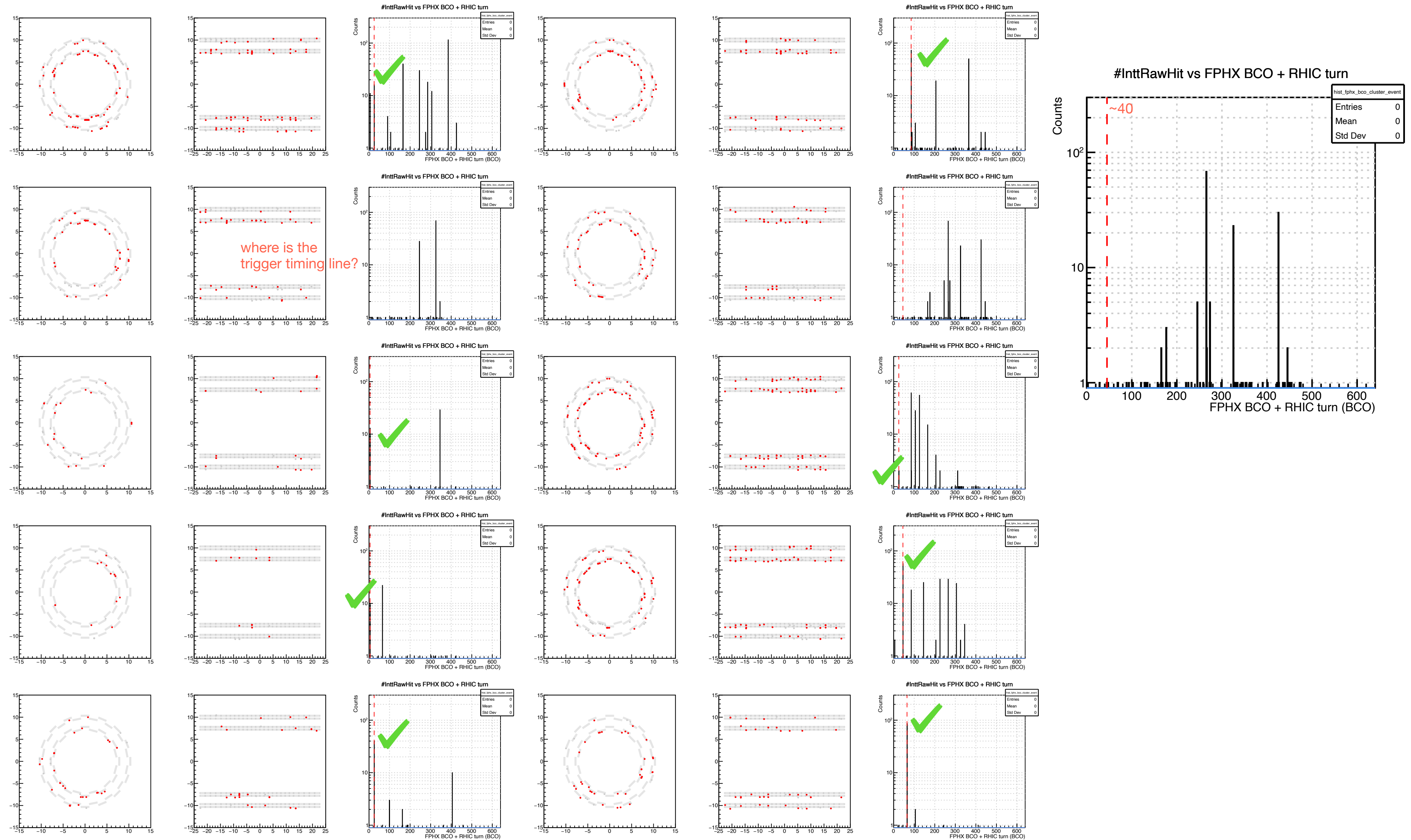
Some event displays

Run 52078



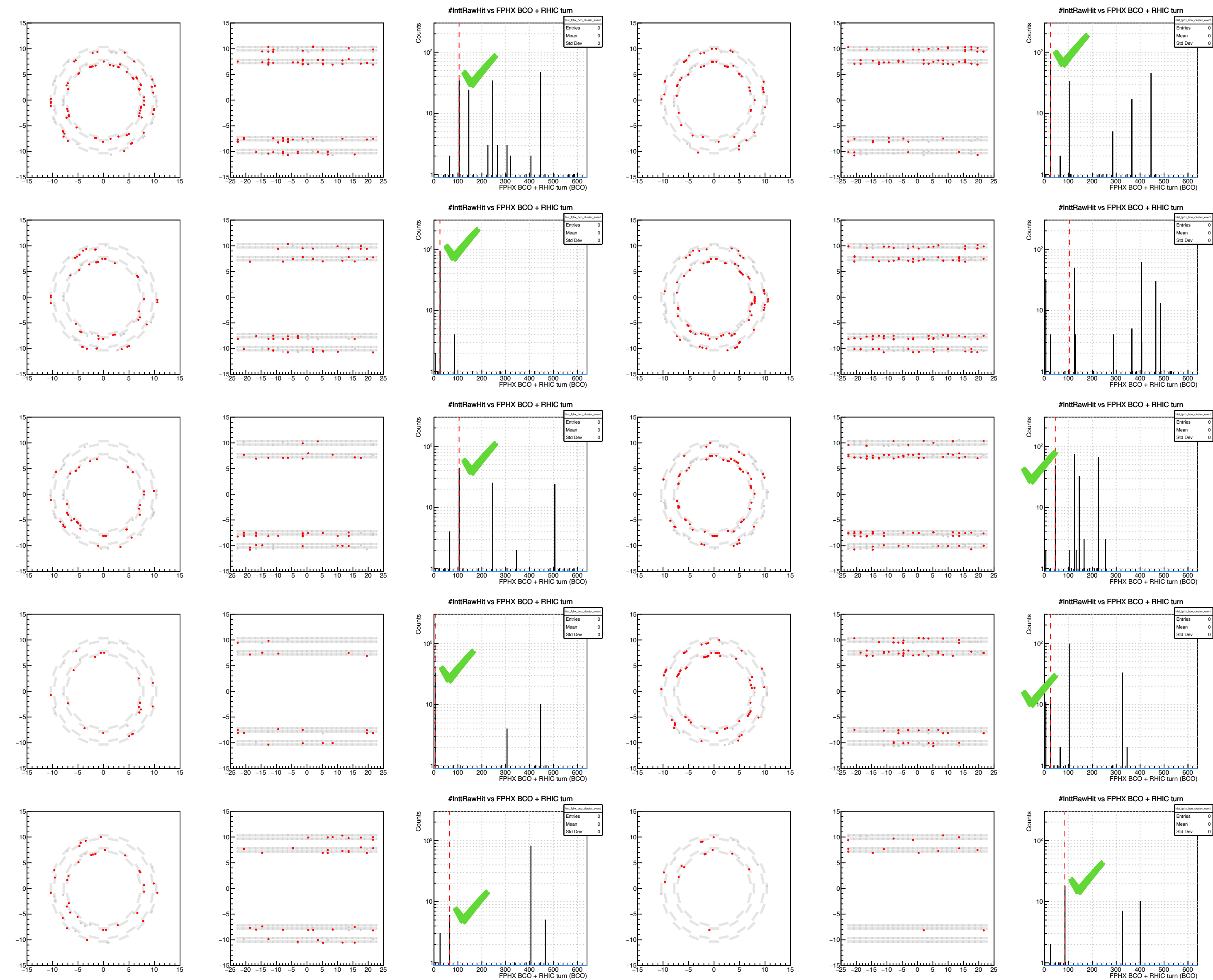
Some event displays

Run 52078



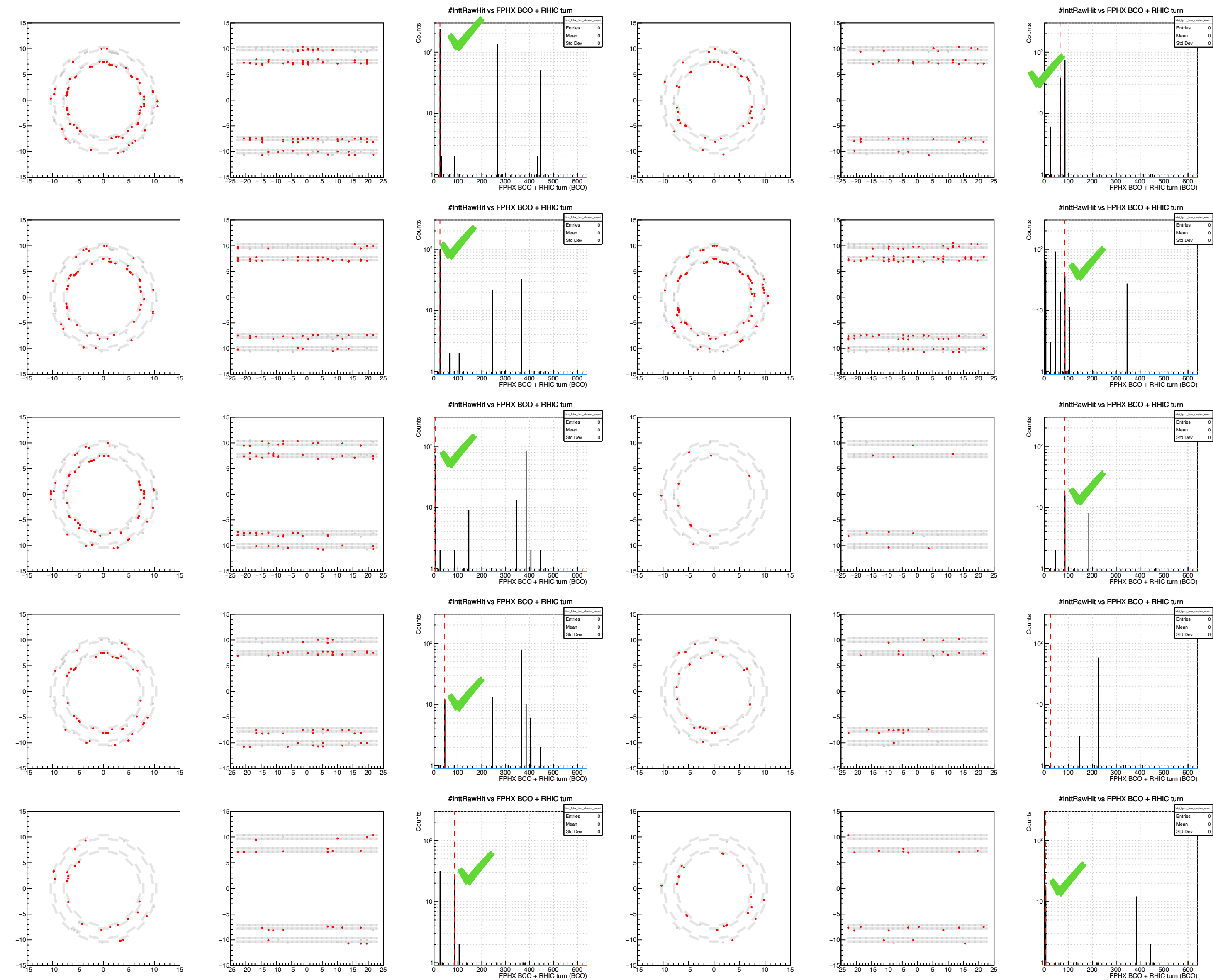
Some event displays

Run 52078



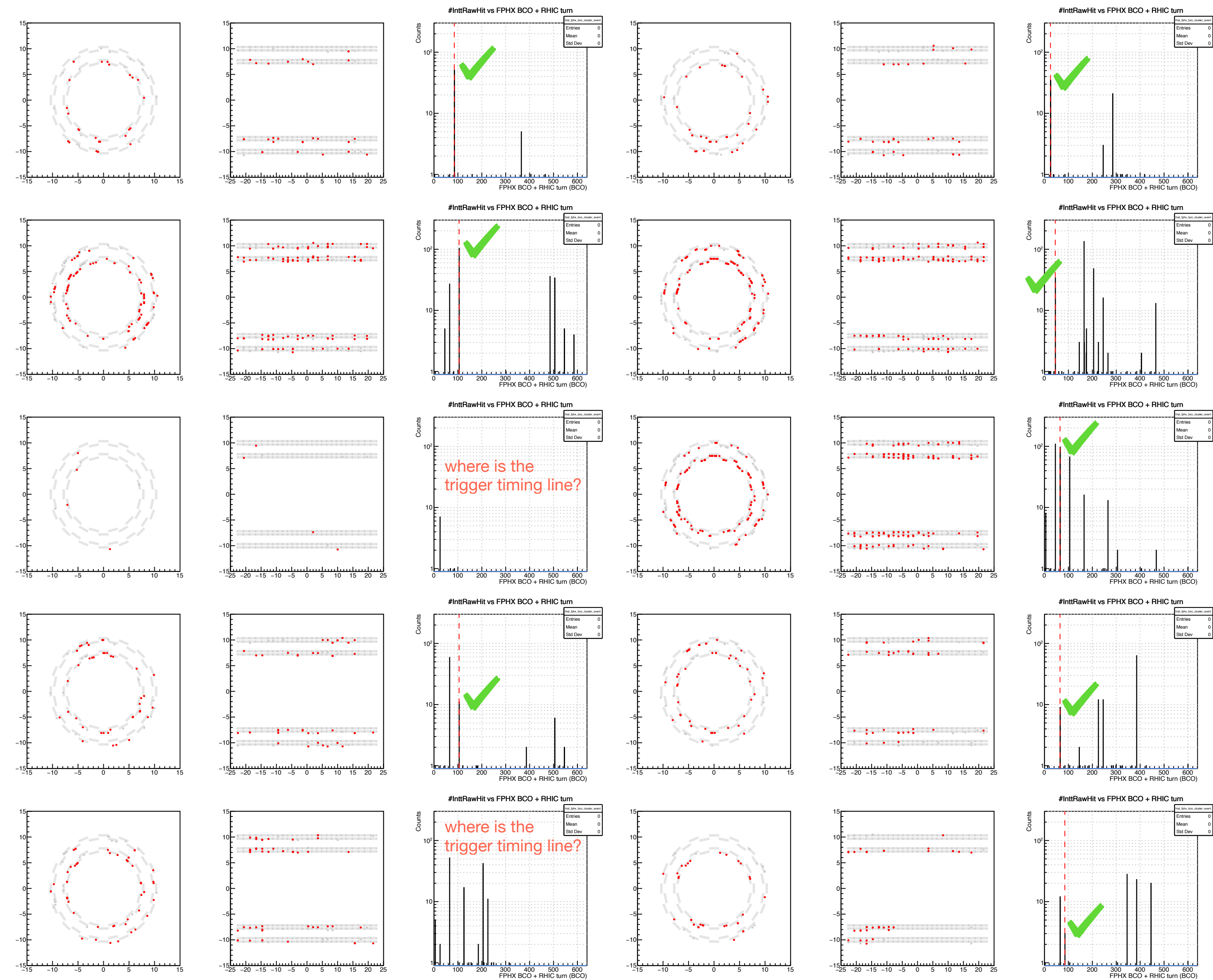
Some event displays

Run 52078

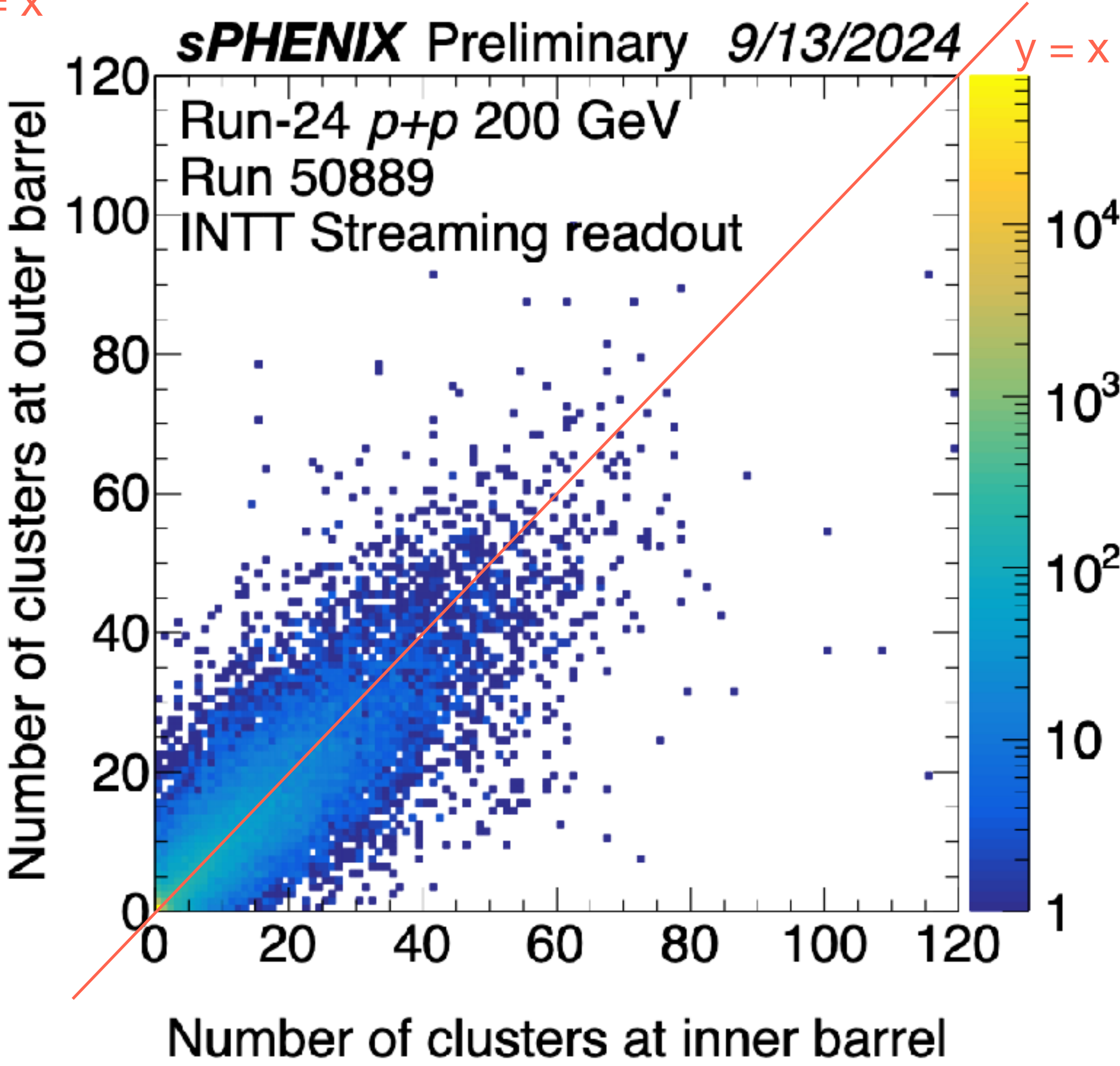
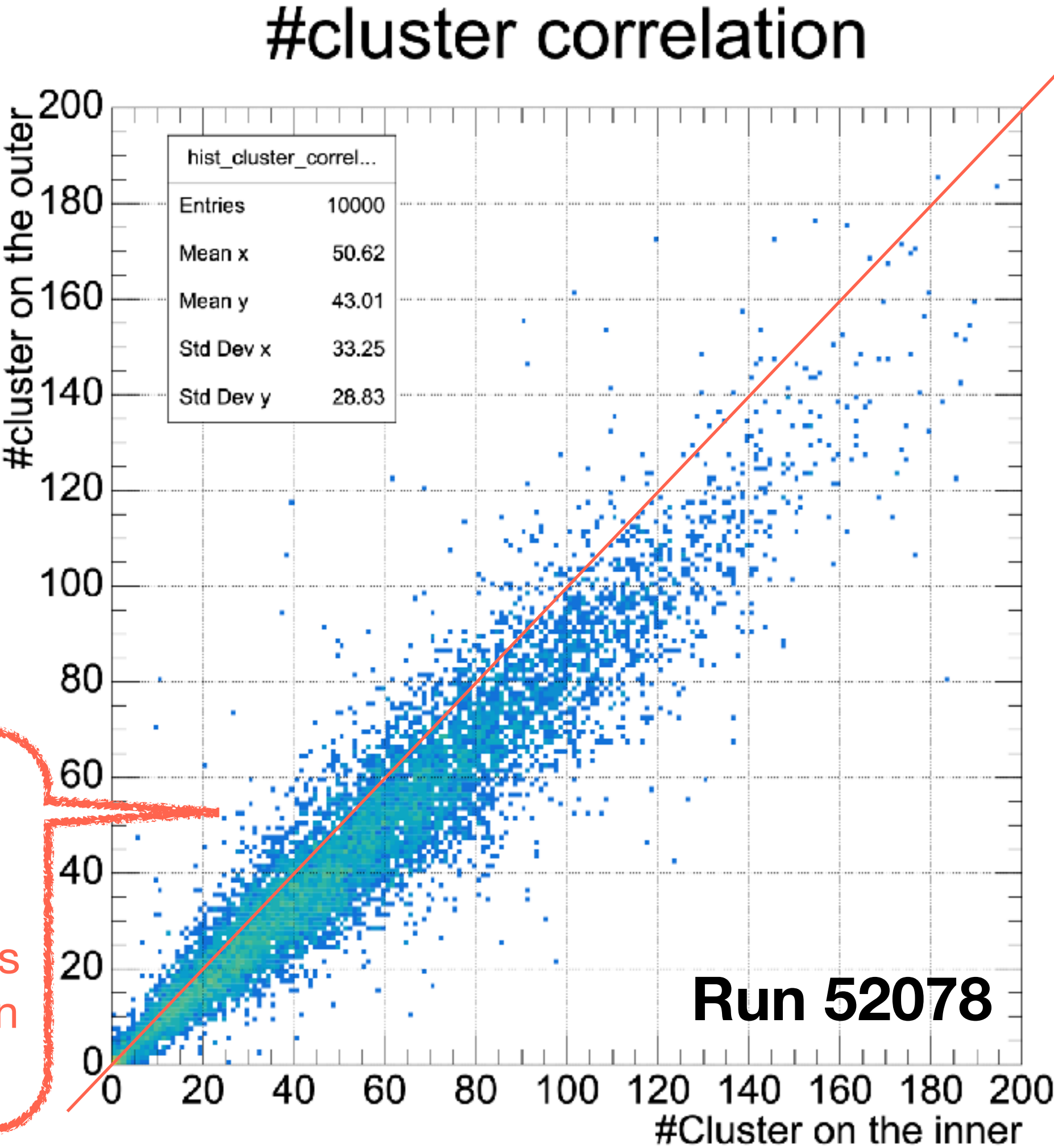
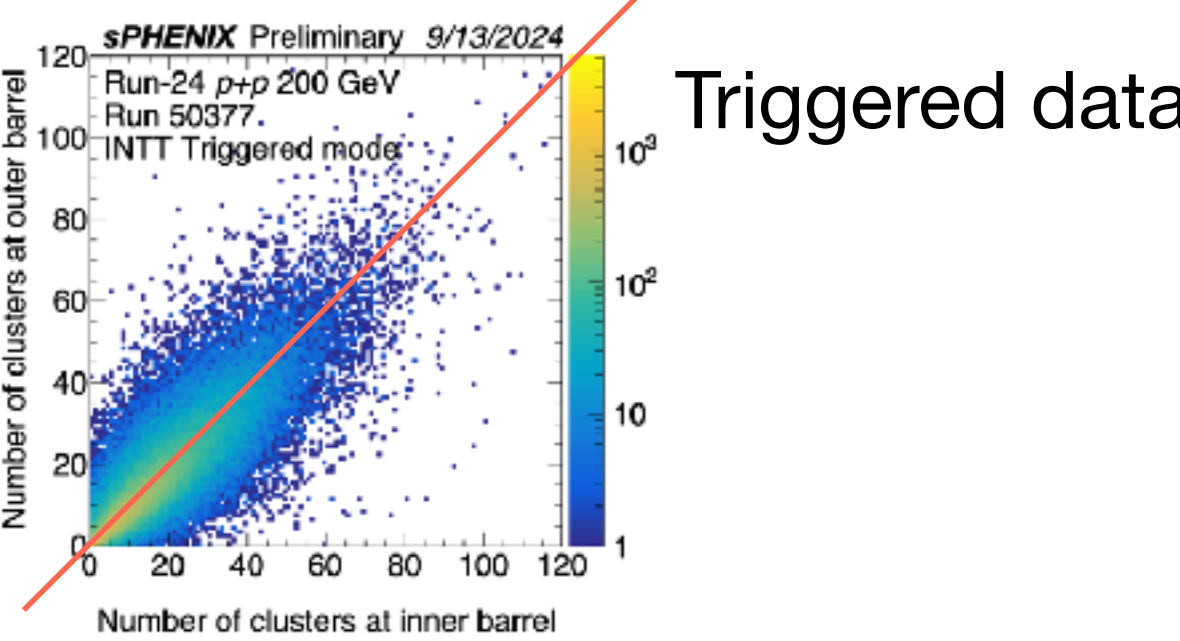


Some event displays

Run 52078



Quality check



???

#cluster on the outer barrel seems to be less than expectation

Timing selection:
the trigger timing ± 2 BCOs is accepted.

Next

- Testing the cluster selection method with Hinako's tracking code.
 - I put serious bus by myself to the codes... I need time for debugging.
- I'll give Ryota the cluster selection method.