

# Stream data analysis

Takashi HACHIYA  
Nara Women's University

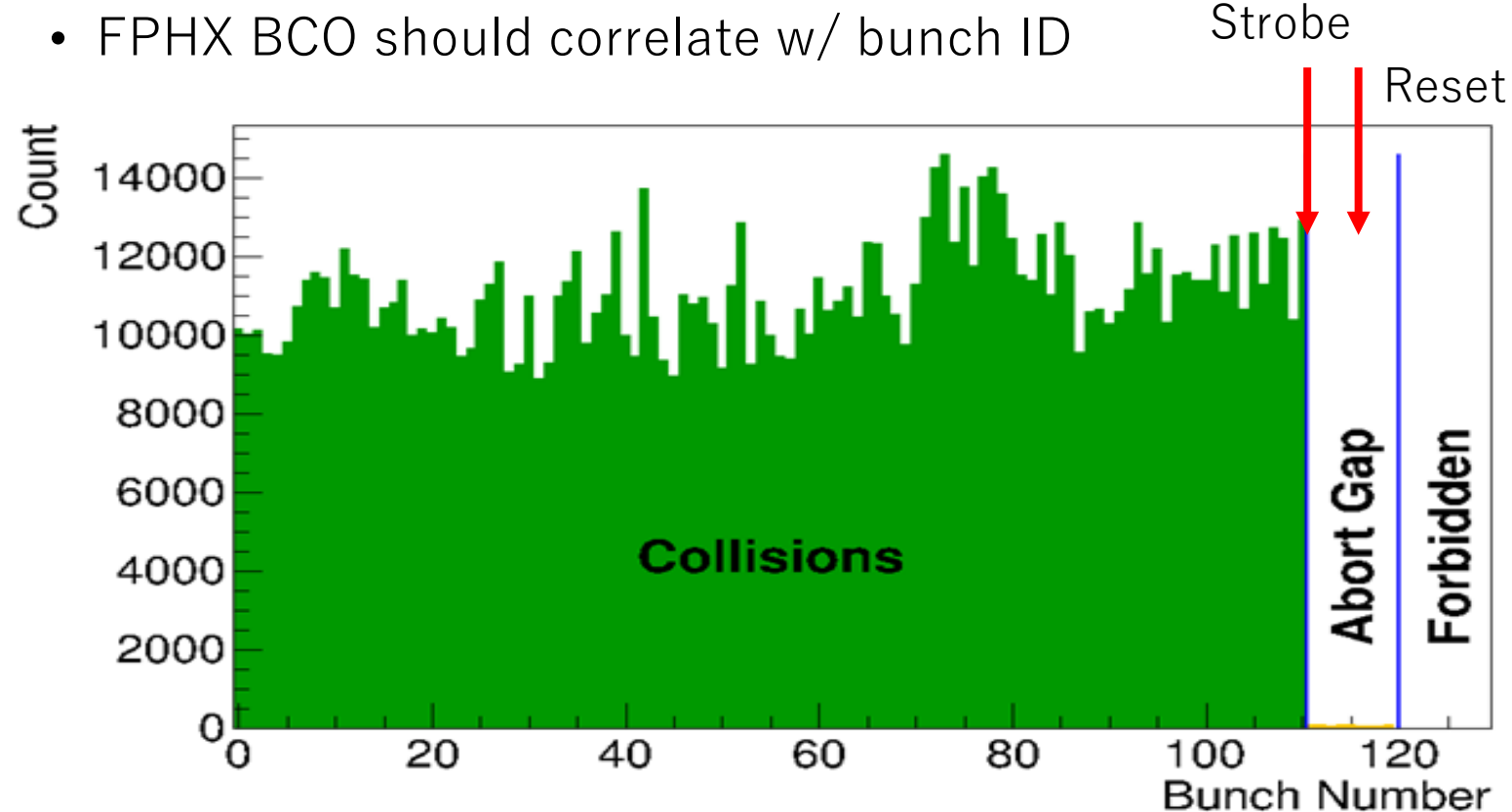
# Streaming status

- INTT is about to switch to the streaming mode
  - Currently the trigger mode w/ extended time (10us)
- Raul & Enokizono-san took the stream data w/ big partition
  - Need to check if we are ready to switch
  - Run47977 analyzed and compared w/ triggered data(run47982)

Run Number	Comment
47932	Streaming readout plots look fine for all servers;
junk run (bring STAR into collisions)	--
47945	Streaming readout plots showed abort gap of all servers aligned, but in the wrong place;
47946	Streaming readout plots look fine for all servers; "Decoding Rate" plot mismatch ended the run, according to standing orders;
47947	Akitomo and I were busy, didn't look;
Next Store	
47966	10M events, but test run by Joey. Maybe useful
47972	32M events. intt5 dropped early
47973	7M events. intt4 dropped
47975	12M. no issue. Stopped for polarization mes.
47976	32M events. intt4 dropped
47977	9M event. no issue
47978	20M event intt 1, 4, 5 dropped
47979	24M events, intt 7 dropped
47982	Back to Trigger mode from this run

# Stream mode

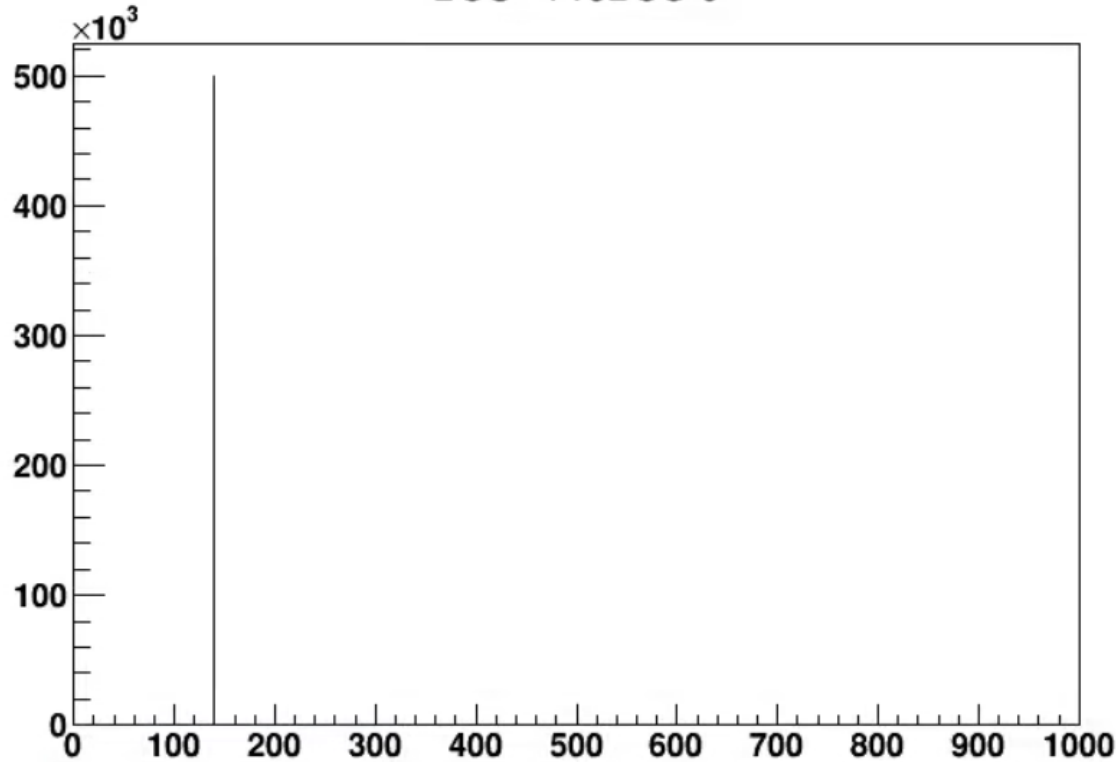
- To make the stream mode simple, Raul setup
  - Strobe is issued once per 120 BCO (= one RHIC cycle)
  - FPHX BCO is reset by 120 BCO (=one RHIC cycle)
    - Strobe and Reset BCO happens at the abort gap
    - FPHX BCO should correlate w/ bunch ID



# Basic QA

Strobe interval (Strobe BCO - previous Strobe BCO)

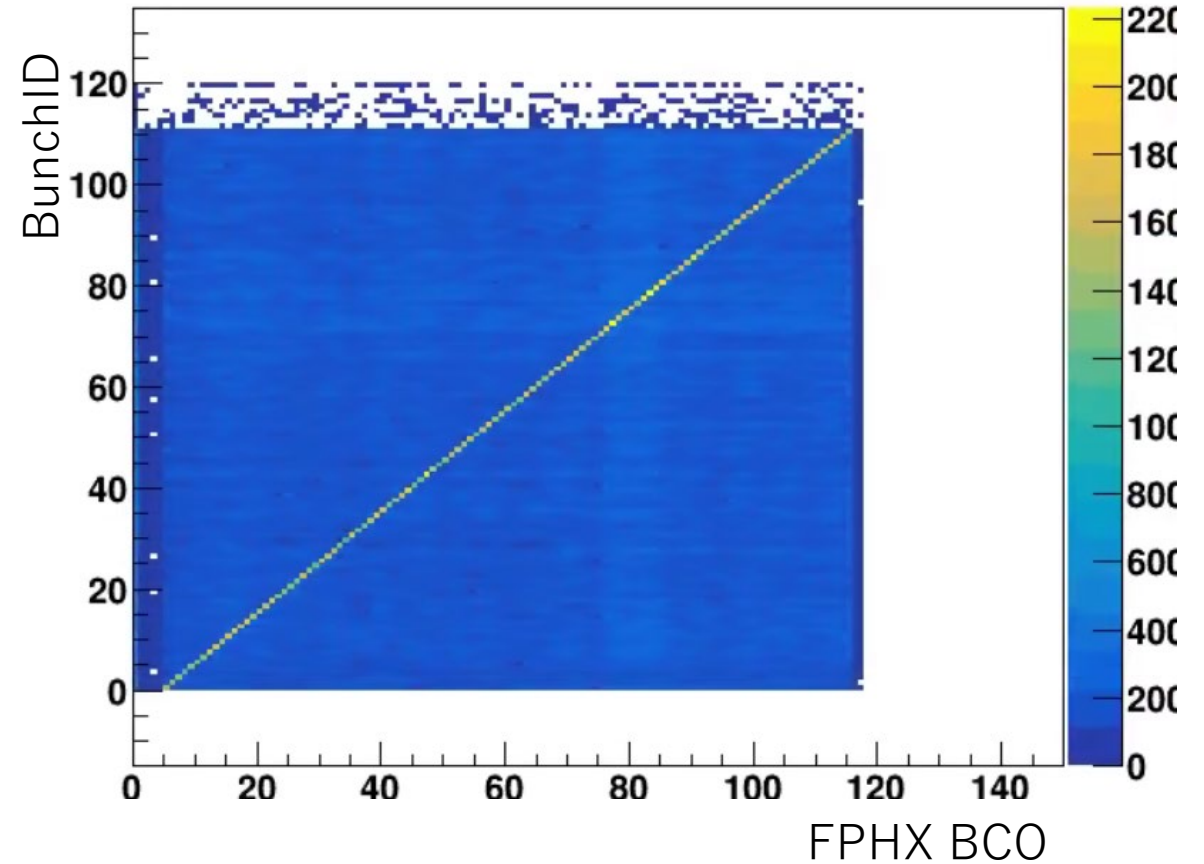
BCO - PreBCO 0



120 (consistent w/ the design)

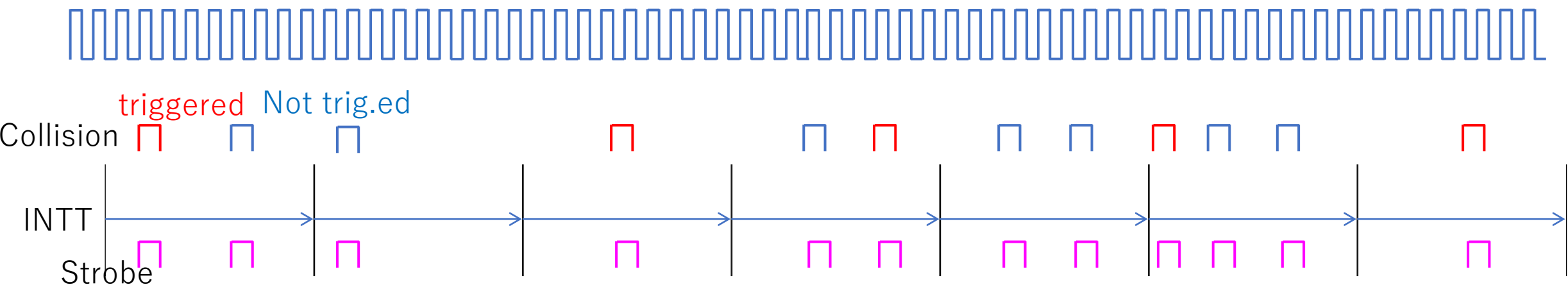
Bunch vs BCO

bunch vs BCO 0

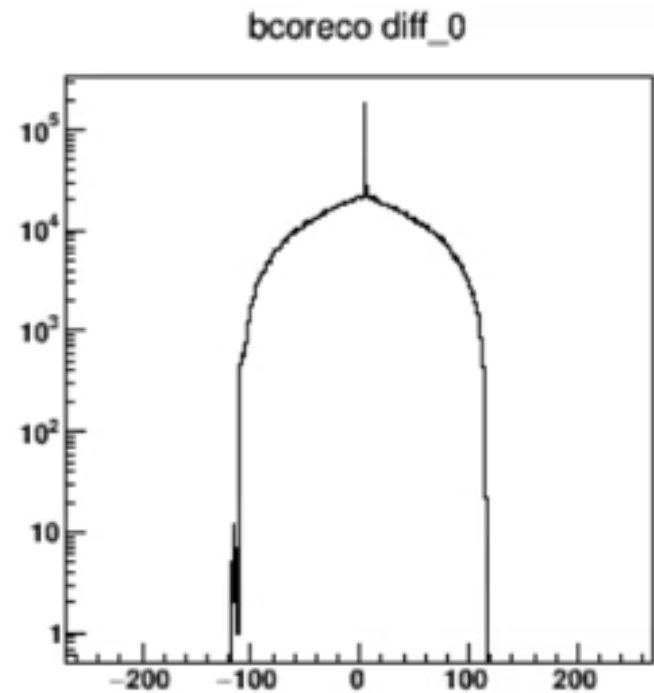


- A clear correlation

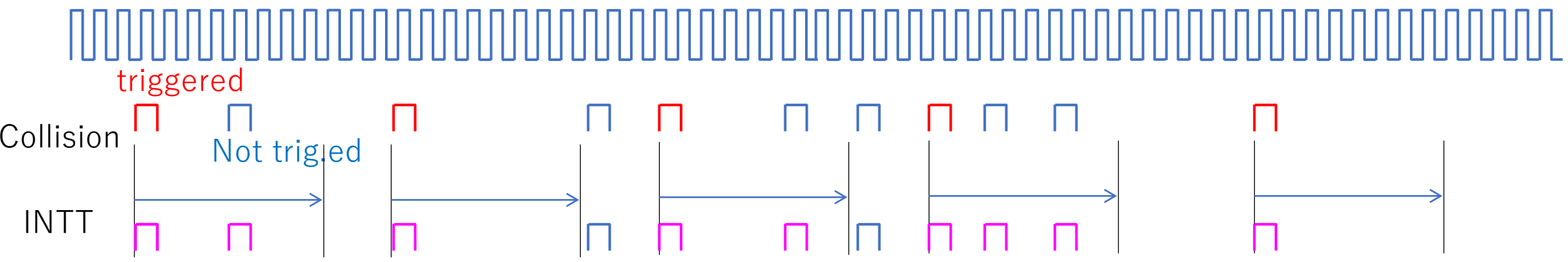
# Finding the triggered event in the stream data



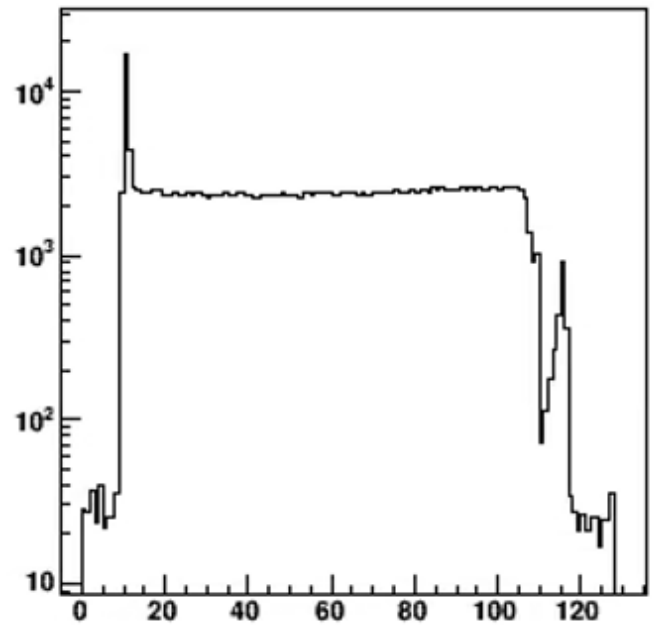
- GL1BCO – HitBCO
  - HitBCO = Strobe BCO + FPHX BCO
- A clear peak in the difference (w/ the offset tuned)



# Finding the triggered event in the triggered data



- GL1BCO – HitBCO
  - HitBCO = GTM BCO (GL1BCO) & FPHX BCO
- A clear peak in the difference

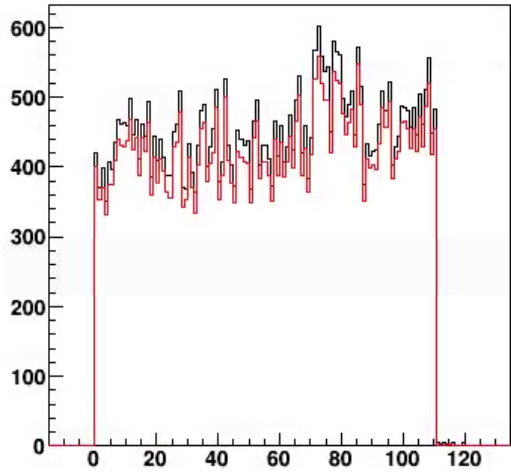


# GL1 finding efficiency

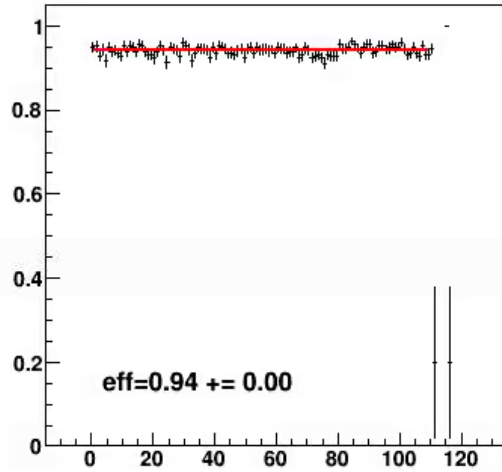
Streaming (run47977)

Triggered (run47982)

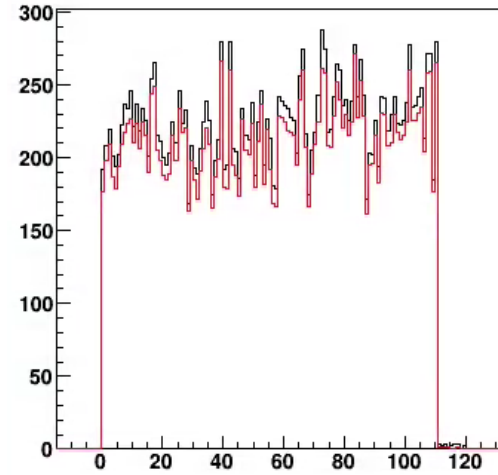
bunch @ gl1



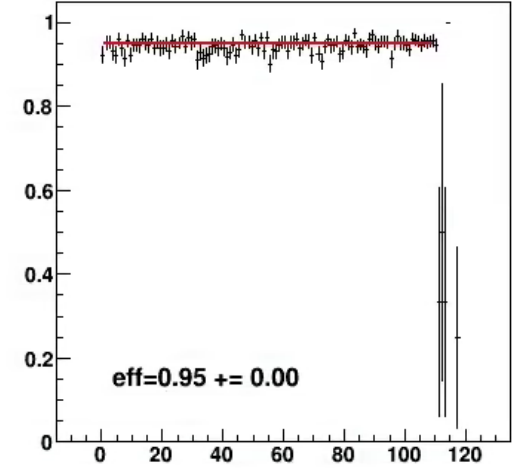
bunch @ evt all felix



bunch @ gl1



bunch @ evt all felix

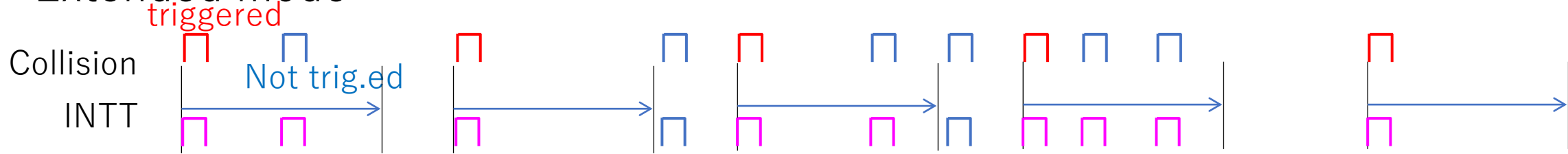


- Finding efficiency is similar for both the stream and triggered
  - It looks that the stream mode works properly
  - Previous study : 98%. Why?
- Offset between GL1 and recoBCO is changed. Why?
  - previous offset was 19, now it is 23
  - If we find the reason, it can use it. Otherwise this should be a calibration parameter

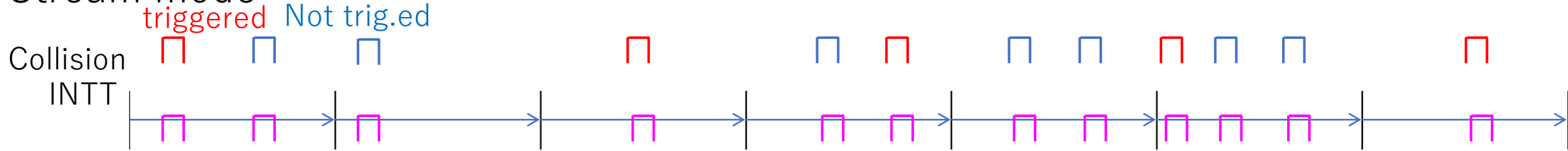
# To do Next

- We need to implement the hit-by-hit the 40bit BCO in the DST production, working w/ Chris. for both the extended and stream mode.
  - Different treatment is necessary for the extended and stream modes

## Extended mode



## Stream mode



- In the DST production, All INTT hits in a timeframe has the identical 40bit GTM BCO (FPHX BCO not used)
  - Use FPHX BCO to separate hit time by combining DCM BCO(40bit) + FPHX BCO (7bit)
- The definition, value, of FPHX BCO is different for the triggered and stream mode
  - Triggered : running continuously
  - Stream : reset every 120 clock (one RHIC cycle)



SPINMONDRAW\_3 Run 47982, Time: Thu Jul 11 04:37:53 2024

