

# XTC2 Readout with Run Control

Matthew Jones

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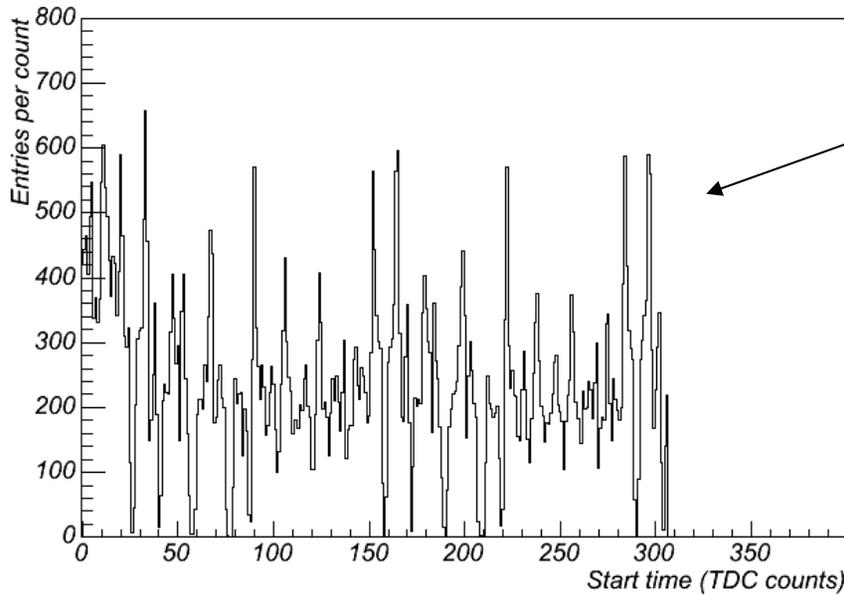
- Recent progress:
  - L2 buffers on XTC2 card in muon test stand are read out using CDF online framework
  - XTCD banks are formatted and analyzed using CDF offline framework
  - Several issues associated with how to do this are now understood

# XTC2 Readout in test stand

- Currently using fer compiled in /data1/cdf\_xft/fer
- Several changes required in TDC\_imp.c and TDCTest.c
- XTC2 register values read from text file
- Scans COT calibration pulse in fine steps over dynamic range of TDC (DSP v63)
- COTD and XTCD banks stored in look area and analyzed offline

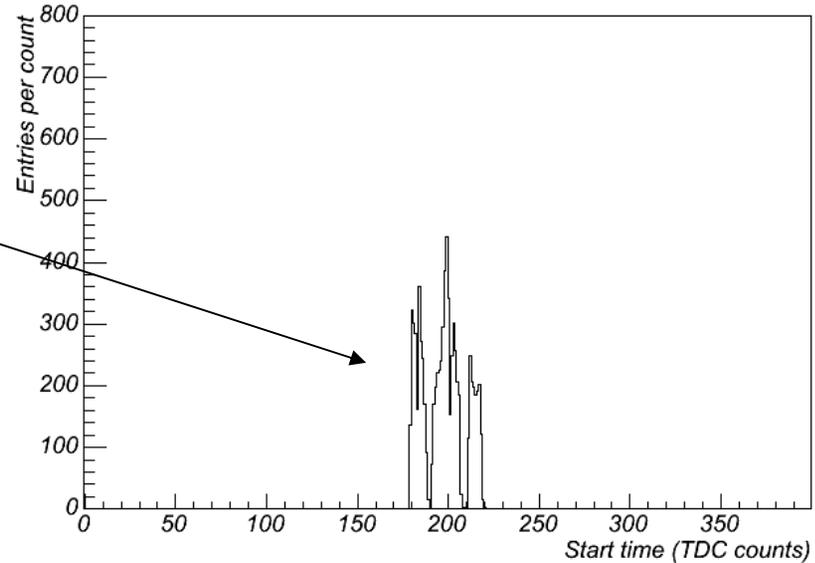
# XTCD data (channel 0 as example)

All TDC data, Channel 0



Start time of all events

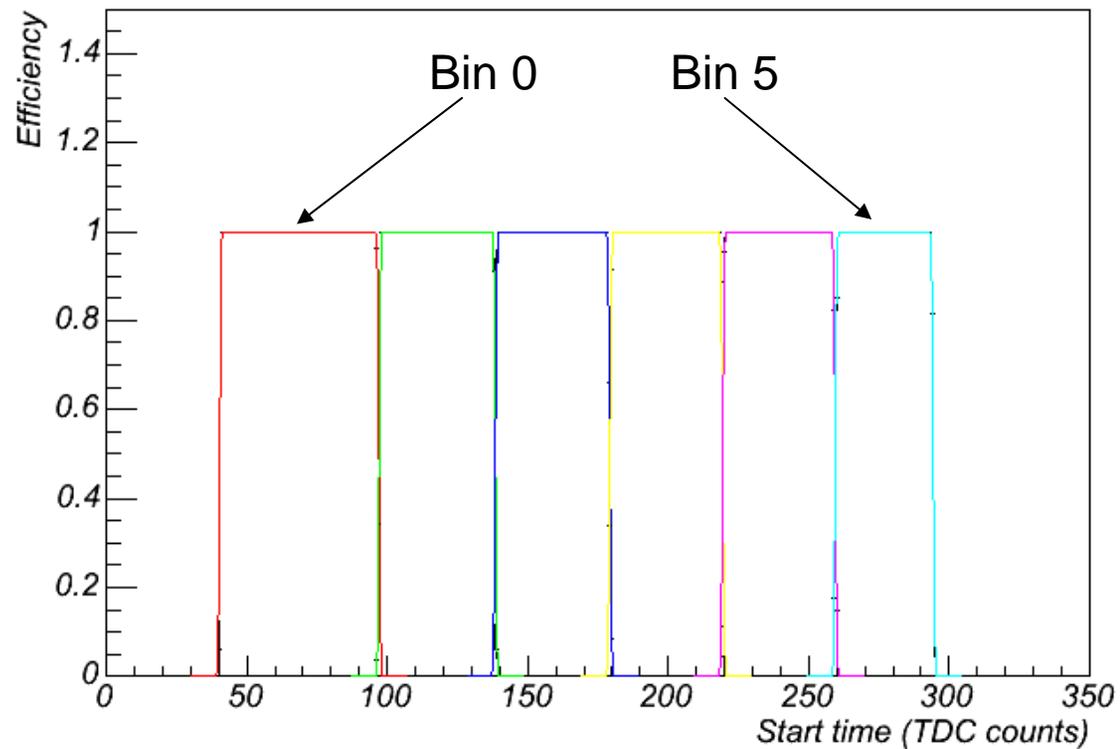
Start time, channel 0, bin 3



Start time bin 3 is first to fire

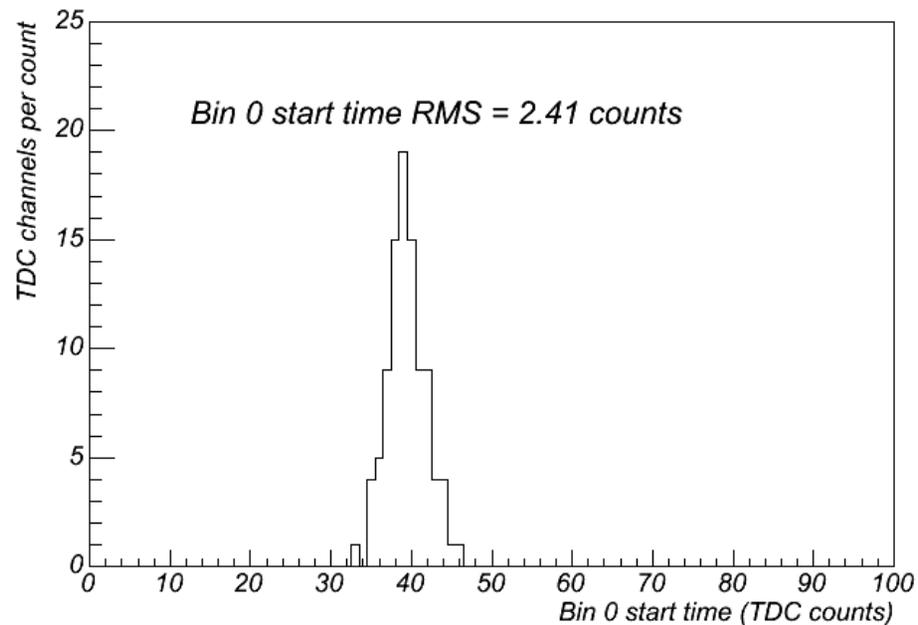
# XTCD data analysis

- Divide histograms to calculate efficiency, fit to find bin edges:



# XTCD data analysis

- Measure the spread of bin 0 start times:



- Need more XTC2 cards/TDC's to study how systematic this feature.

# Important things

1. How to configure hardware database in order to program FRAM on TDC's
2. How to time in all the hardware in the test stand (should be equivalent to hardware on detector)
3. Only data recorded with L1 accepts coincident with CDF\_BC are meaningful
4. This can be achieved using "Svx396" mode (which is confusing to Run Control)
5. Mapping of TDC channels to bits in L2 buffers

# Next Steps

- Analyze XTCD data to map out not-sure window boundaries
- Retrieve XTC2 register contents from hardware database (Bill will set this up)
- Migrate changes to TDC\_imp.c into default fer package
- Read out XTC2 cards on detector and start validation effort
- Now have all the data needed to model XTC2 cards for emulation code

# Next Steps

- XTCD bank now fully specified. We can finalize the XTCD section in note 4152.
- XTCD bank accessors can be put in repository (Simone offered to do this).
- Test stand + offline software could be an option for testing many XTC2 cards at once (probably limited by number of available TDC's)
- Some components of the analysis should migrate from the offline to the TDCTest.c code.
- For special studies, offline analysis is probably still best.

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