TAC analysis

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Beamline Meeting: 12.17.17

WILLIAM & MARY
CHARTERED 1693

Overview

- **Goals:**
  - Analysis of previous TAC runs to compare with other studies of PS acceptance + include TAGM
  - Update PS flux for 2016 and 2017 datasets with improved PS and TAGGER calibrations
  - Prepare for analysis of 2018 TAC runs
- **Further work:** plan systematic studies of photon flux

TAC runs

Run #	Converter	Radiator
10851	$5x10^{-3}$ Al	$2x10^{-5}$ Al
10852	750 μm TPOL	$2x10^{-5}$ Al
11358	75 μm TPOL	$2x10^{-5}$ Al
30379	75 μm TPOL	$2x10^{-5}$ Al
30851	750 μm TPOL	$2x10^{-5}$ Al
30852	750 μm TPOL	$2x10^{-5}$ Al

- These are the “long” TAC runs I was able to find
- Not sure what collimator was used for the different runs
- Not sure if we measured beam current accurately

TAC analysis

- Measure TAC/TAG and PS/TAG coincidences and take ratio for PS acceptance

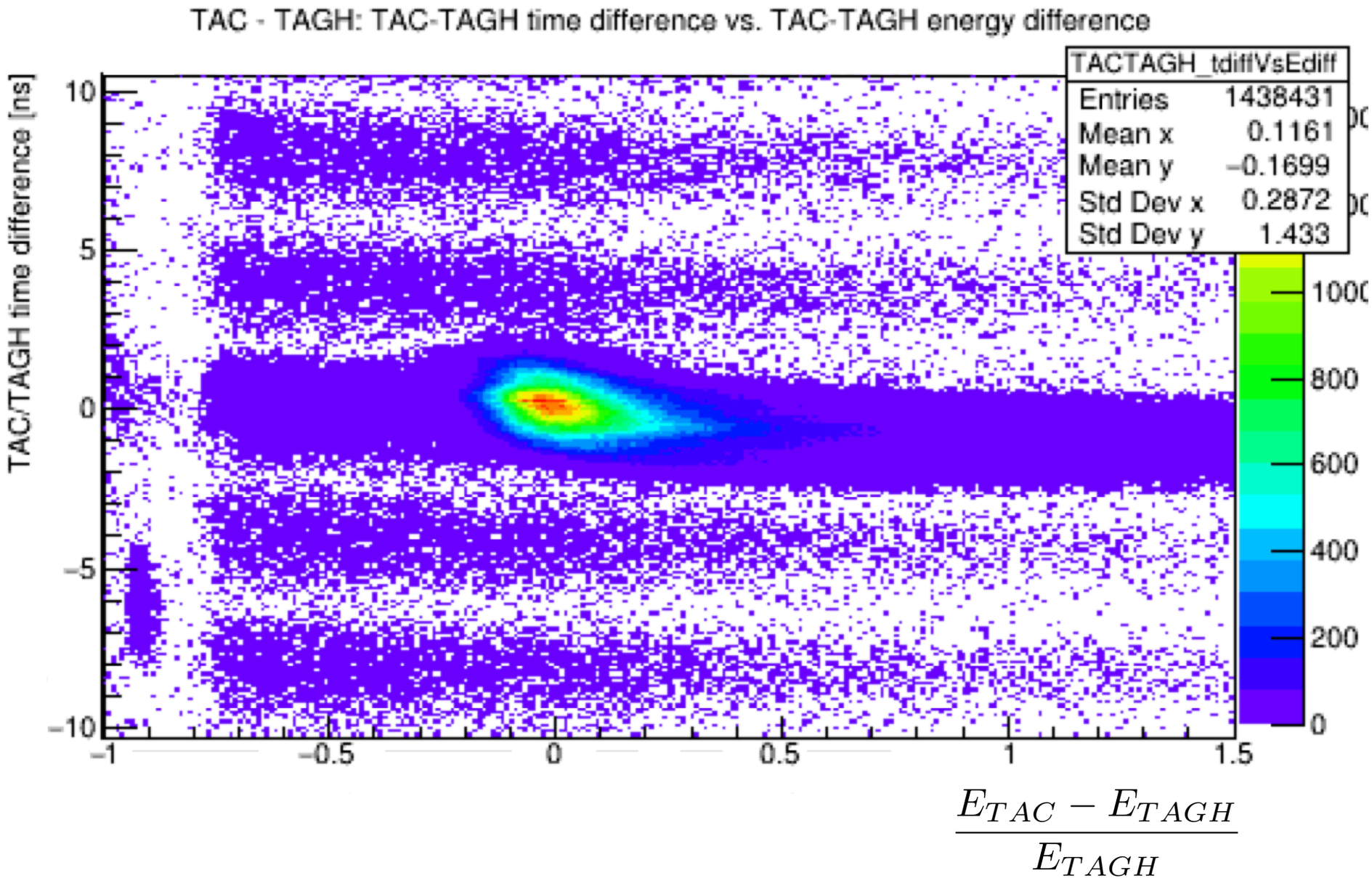
$$A = \frac{N_\gamma^{PS}}{N_\gamma^{TAC}}$$

$$N_\gamma^{PS} = N^{PS+TAG} \cdot \frac{1}{7/9 \cdot RL}$$

$$N_\gamma^{TAC} = N^{TAC+TAG} \cdot Prescale_{TAC}$$

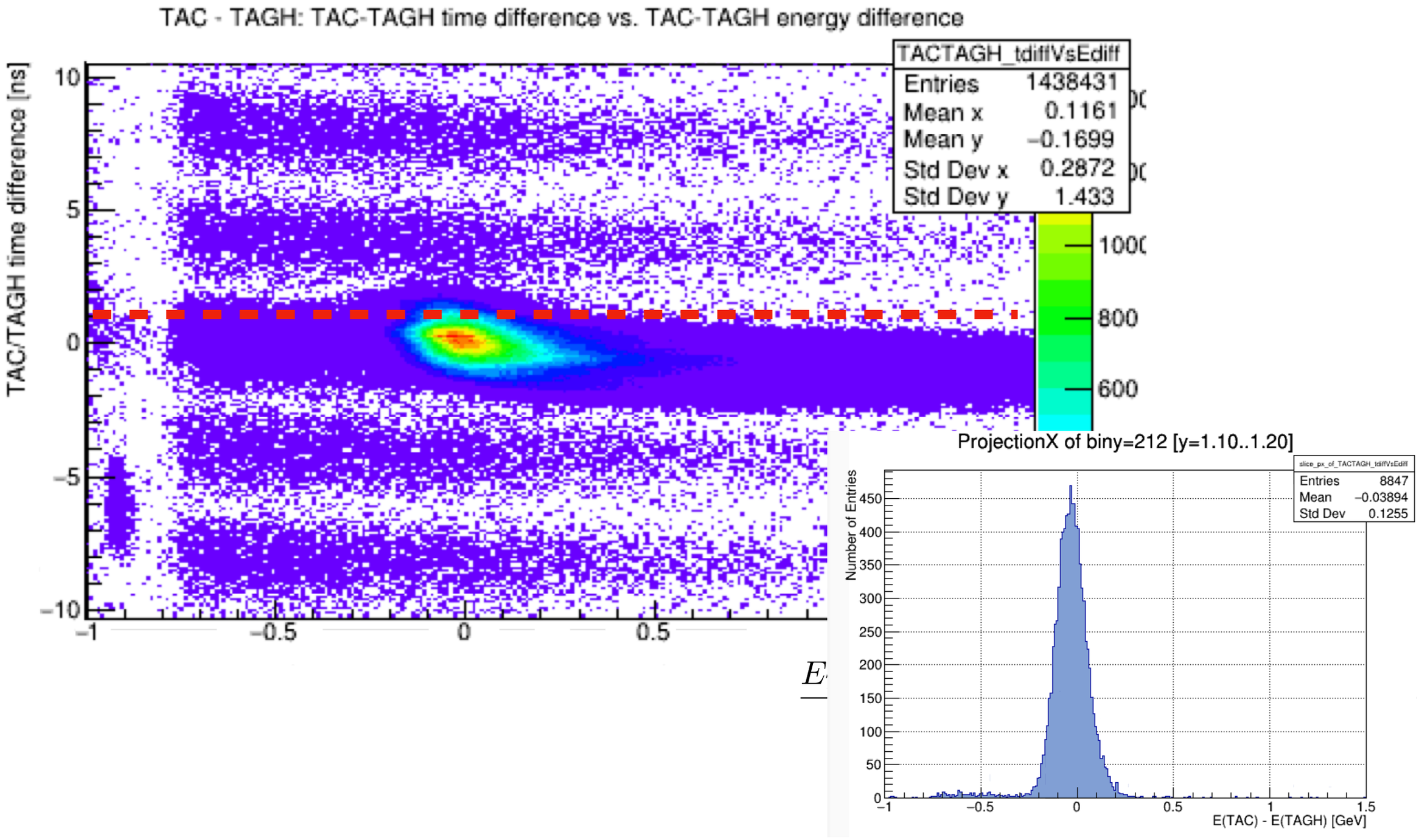
- **Notes:**
  - No TDC data from the TAC
  - Significant refurbishing of TAC this past summer?

TAC/TAGGER coincidence



- Energy difference and time difference are correlated!

TAC/TAGGER coincidence



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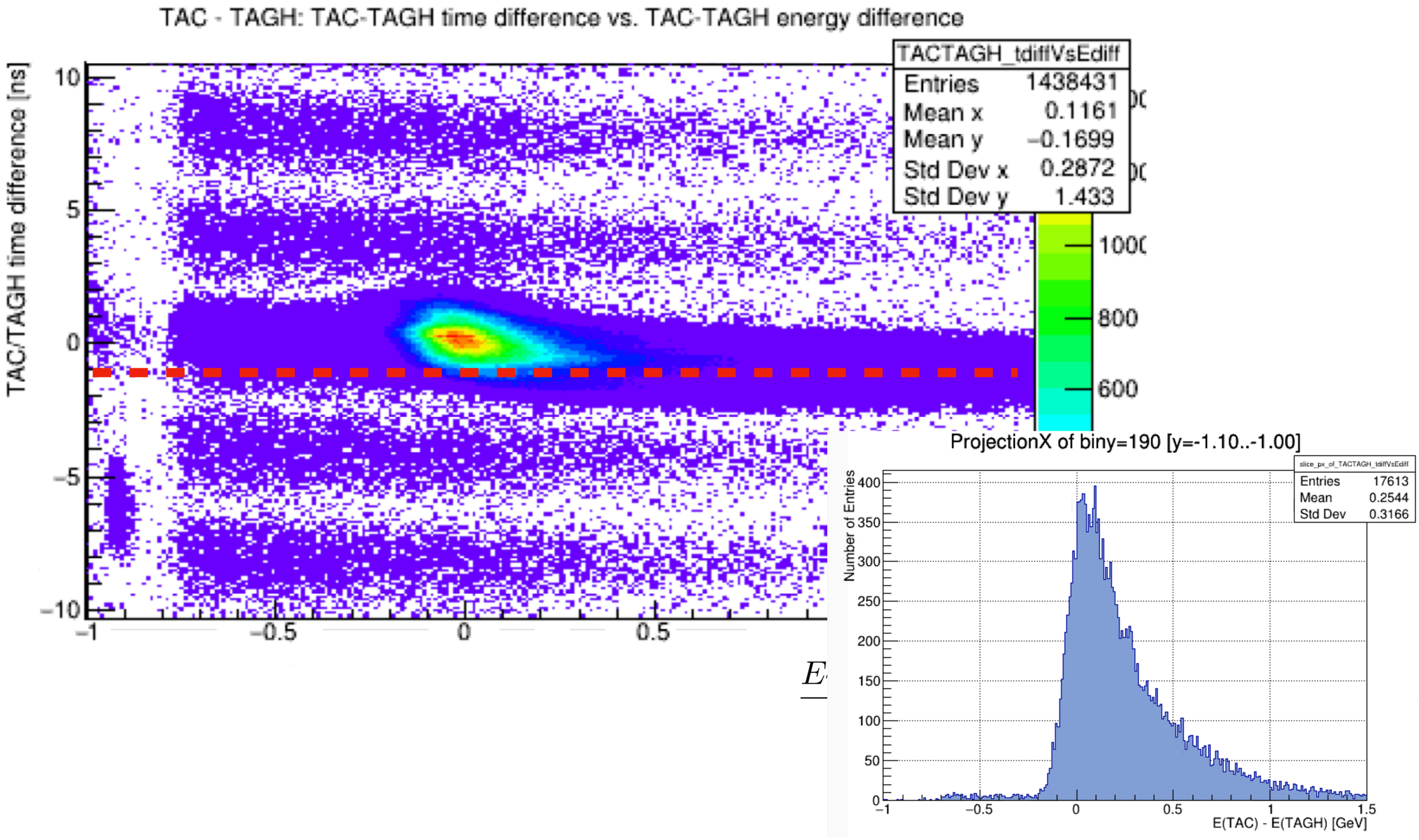

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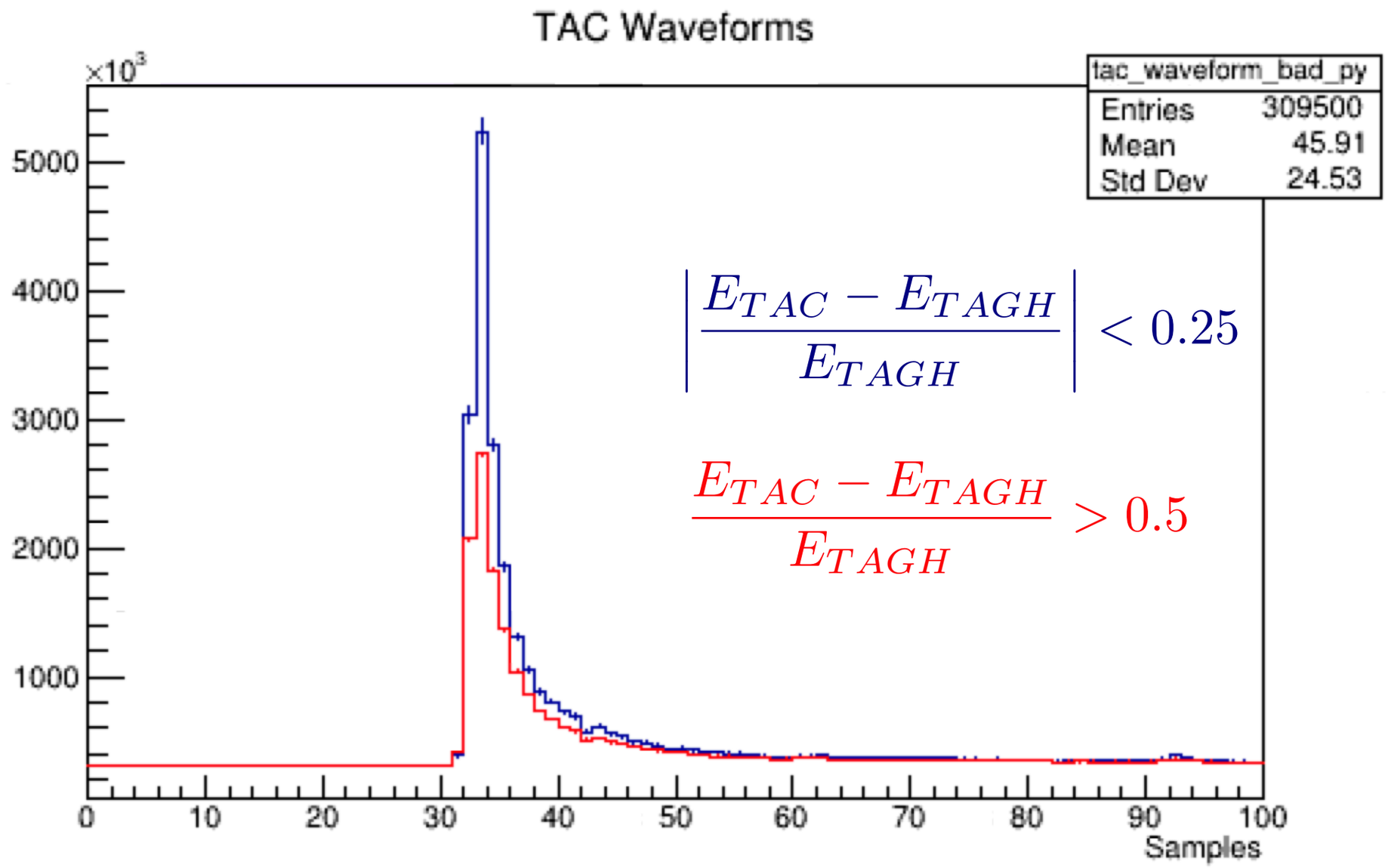
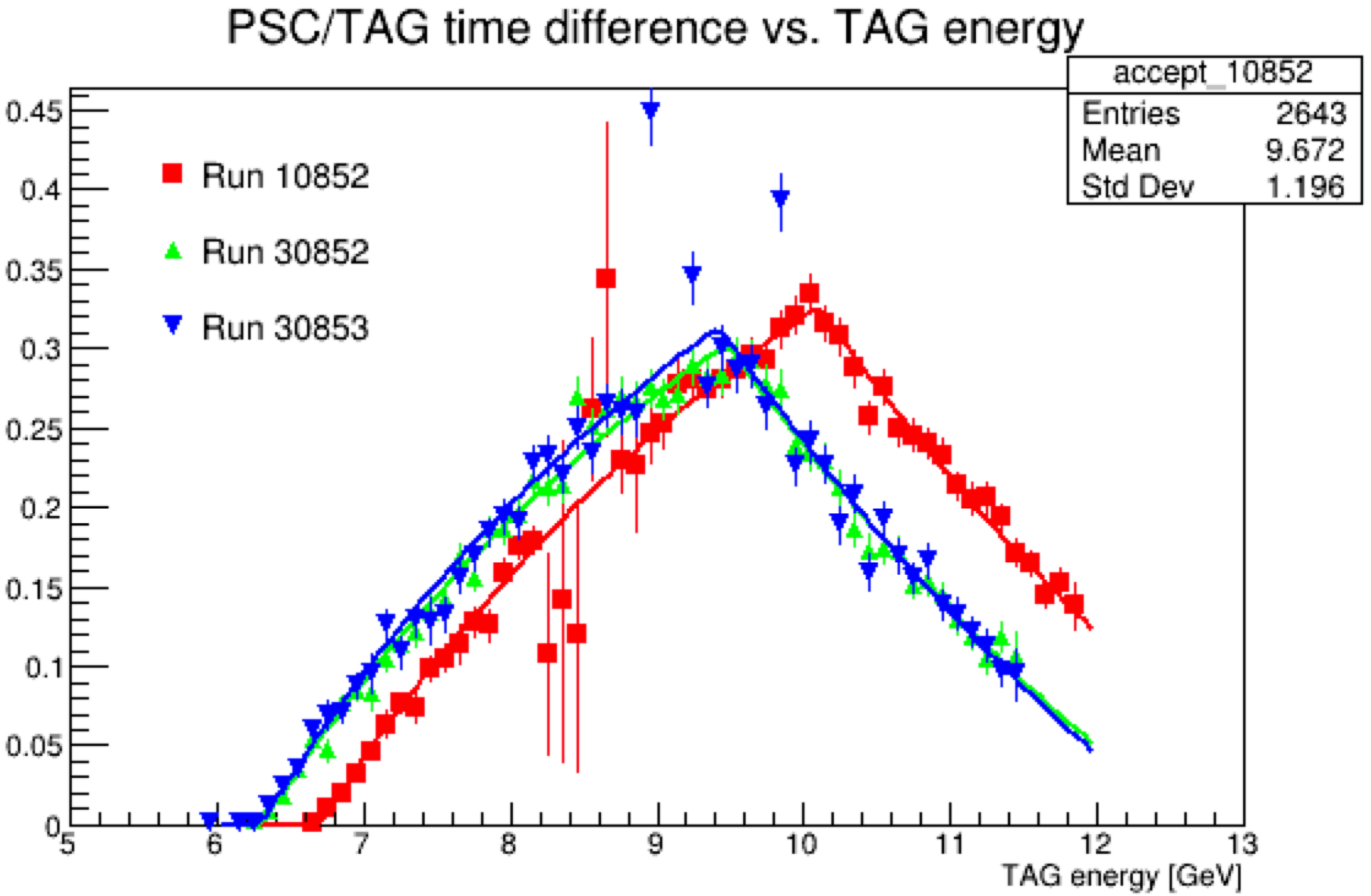
TAC waveform data



- Pulses with poor energy correlation with tagger look the same as good energy correlations

PS acceptance



Flux to do list:

- **Systematic studies needed!**
  - Avoid times near beam trips with David's DBeamCurrent tool (rate dependence?)
  - Dependence on TAC/TAG matching
    - Better understanding of time/energy correlation
  - Impact of material upstream of TAC: are there significant 2016/2017 differences?
- **Plans for 2018 TAC runs and systematic studies?**