

# 2022-08-05 Progress

- Calorimeter Energy Study
- Energy Summing Adjustments

zk

# Source Data

- Calorimeter Elog 2359
- Electron PID cut

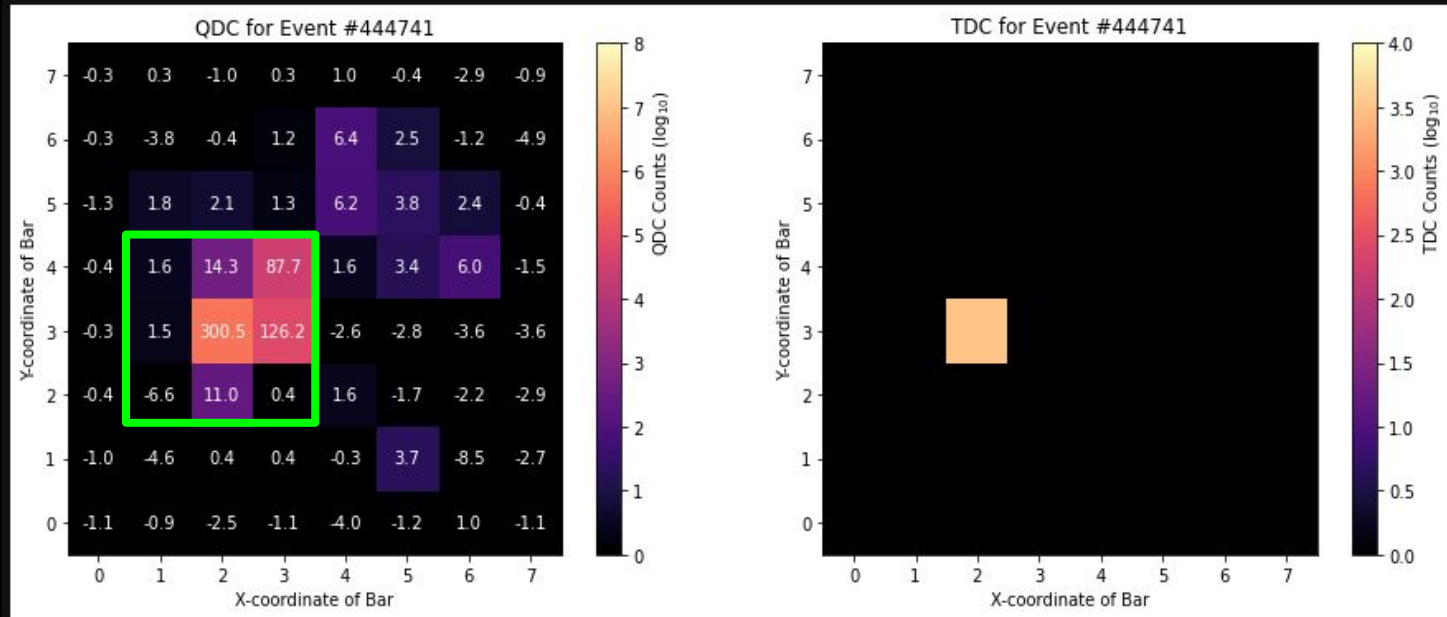
Calorimeter Energy Scan			
- Frontends: TRB3_SlowCtrl, BH, BM			
- BUSY: BH, BM			
- HV: BH, BM, SPSL, CALO, VETO			
- FS11: [10, 10, 10, 10] mm			
- FS13: [5, 5] mm			
Elog	Polarity	Run Number	Momentum
2359	Positive	12354	230 MeV/c
		12355	210 MeV/c
		12356	190 MeV/c
		12357	170 MeV/c
		12358	160 MeV/c
		12359	150 MeV/c
		12360	130 MeV/c
		12361	110 MeV/c
		12362	90 MeV/c
		12363	70 MeV/c
		12364	50 MeV/c

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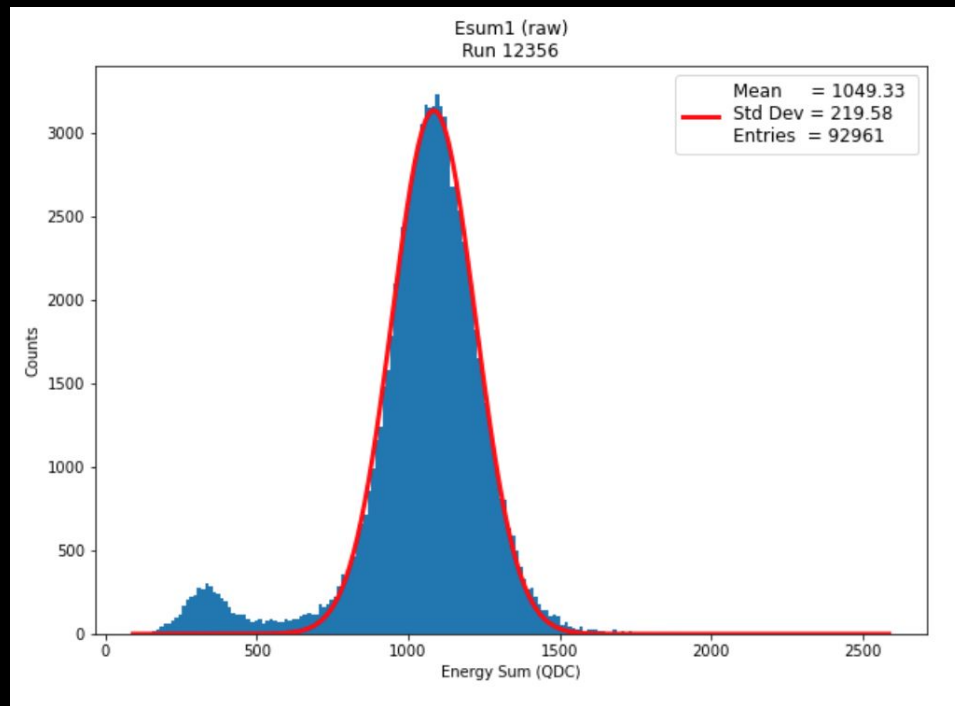
# Energy Sum



Sum of highest QDC + 8  
Surrounding Bars

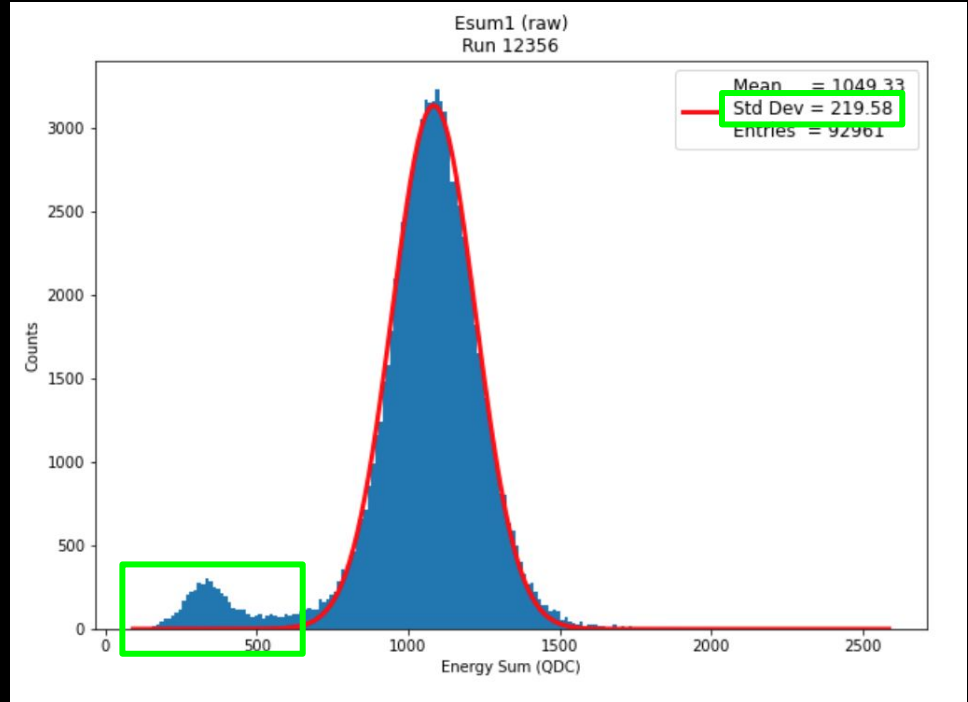
# Energy Sum Histogram

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12354	230 MeV/c
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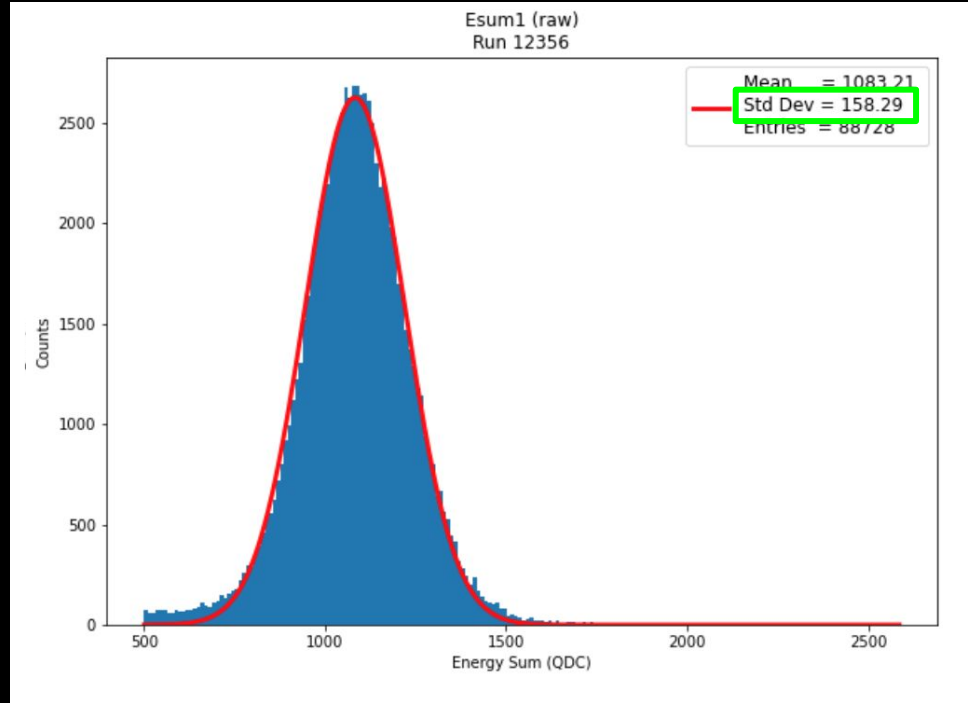
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adjusted

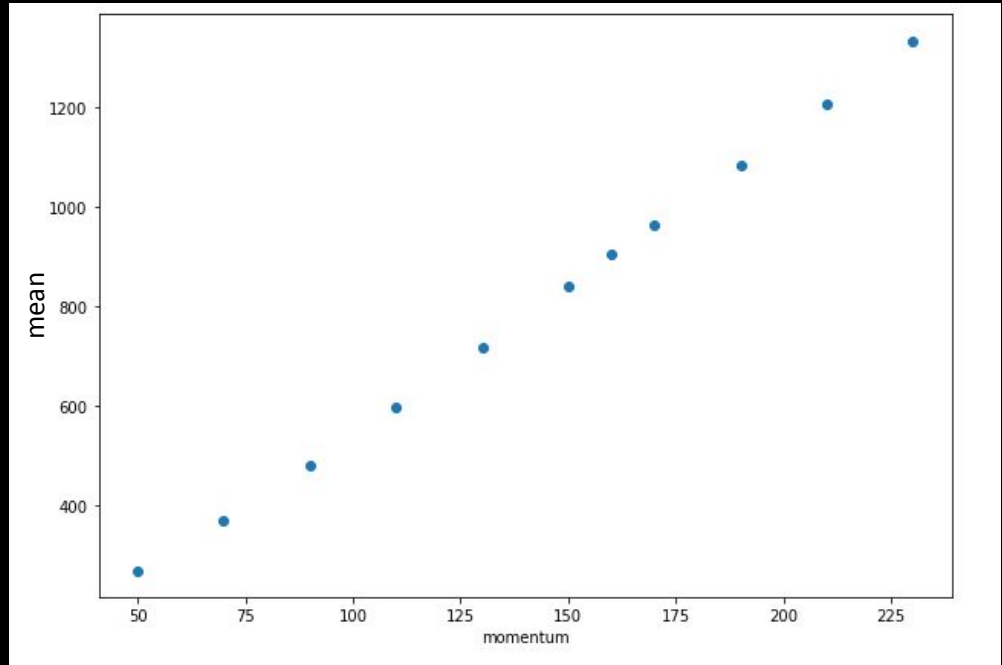
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# Plot 1/3: Momentum vs Mean

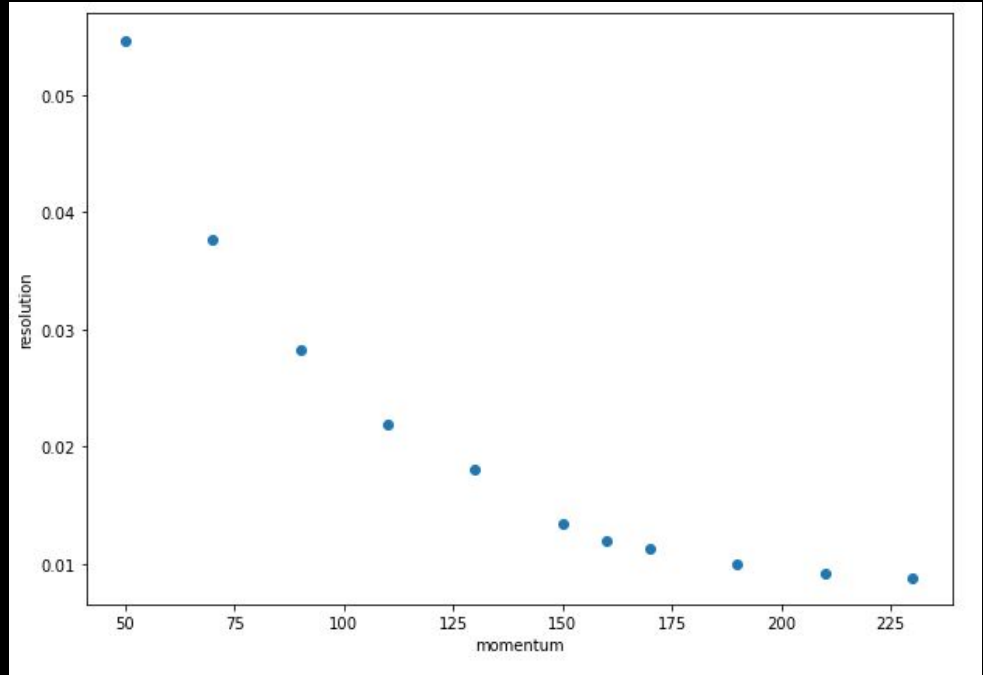
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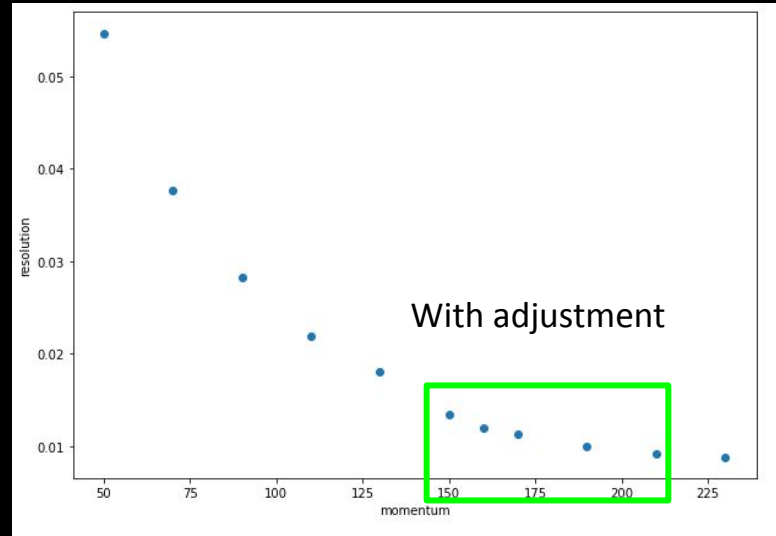
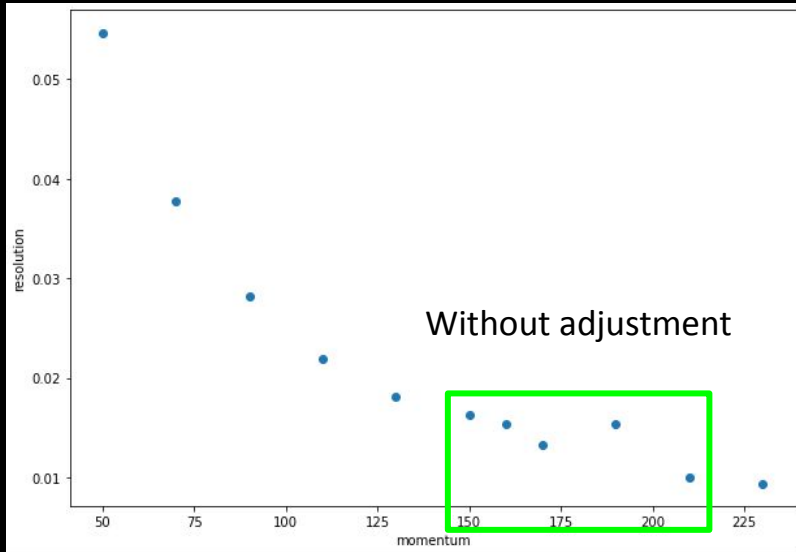
# Plot 2/3: Momentum vs Resolution

$$\text{Resolution} = \frac{2\sqrt{2\ln 2} \cdot \sigma}{p^2 + 0.511^2}$$

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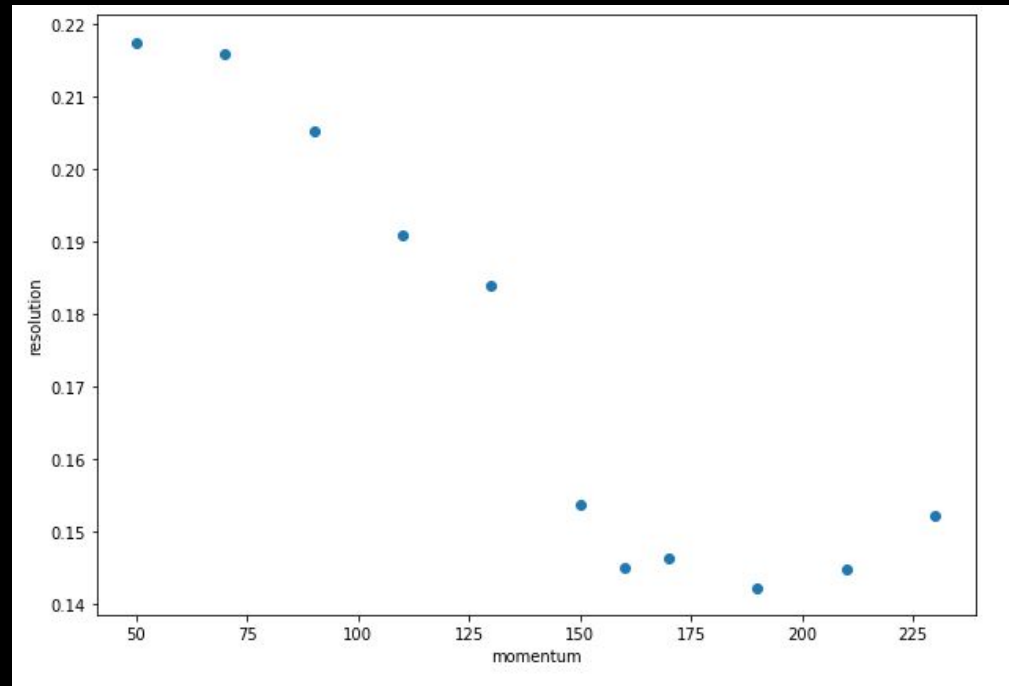


# Plot 2/3: Momentum vs Resolution



# Plot 3/3: Momentum vs $\sigma/\mu$

Run Number	Momentum
12354	230 MeV/c
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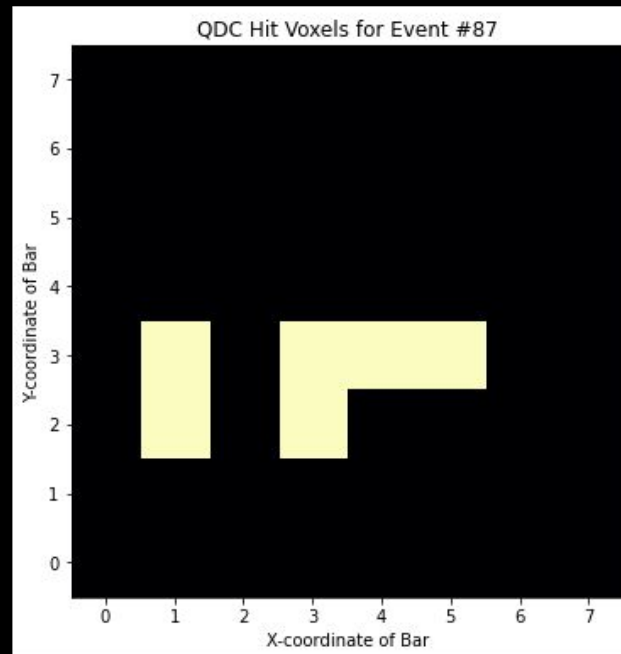
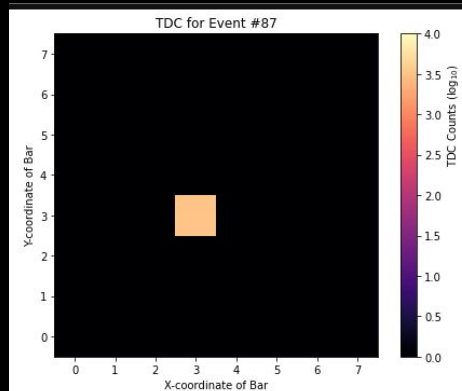
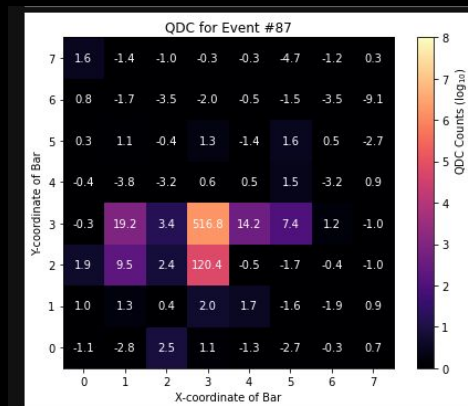


# Adjustments to Energy summing:

1. “Esum2”: Use outliers
2. “DHcut”: Remove double-hit events

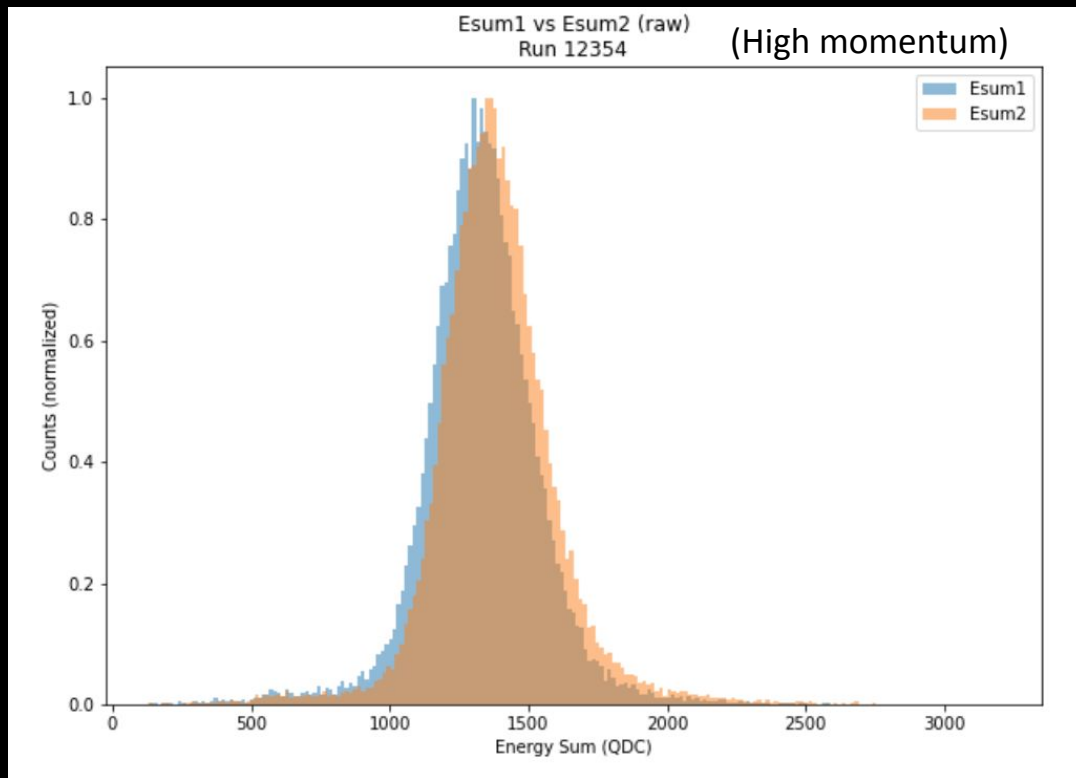
# Adjustment 1: “Esum2”

Sum energy of QDC outliers  
as opposed to highest + 8



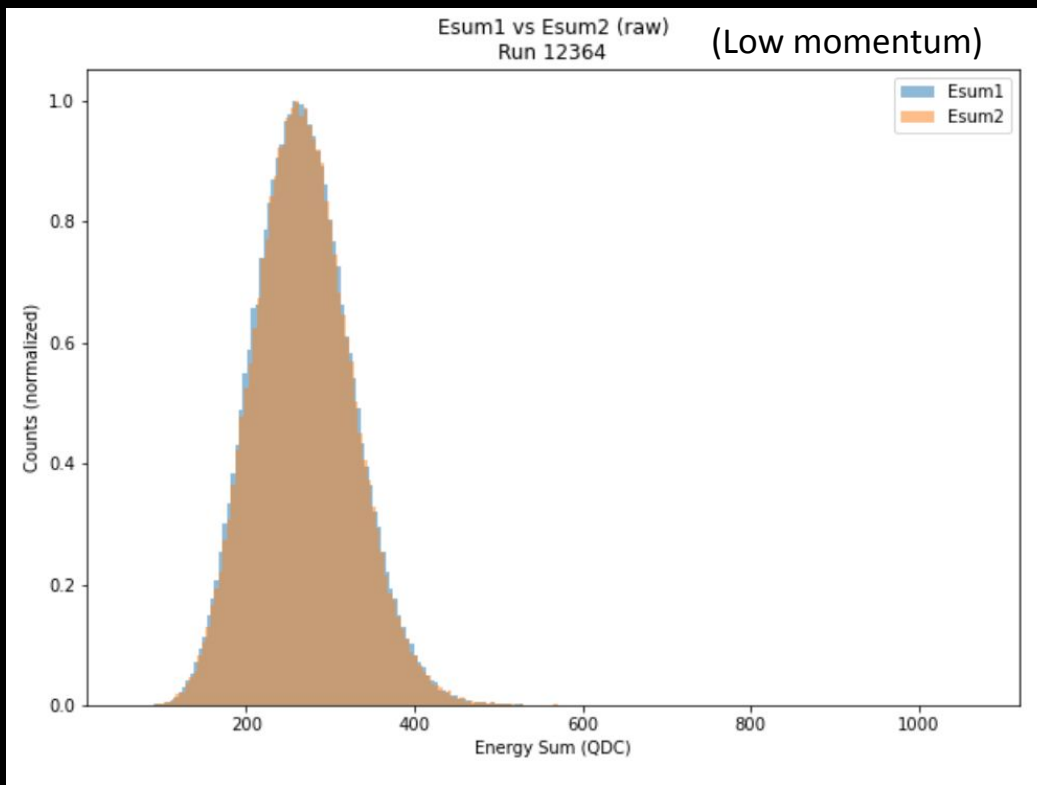
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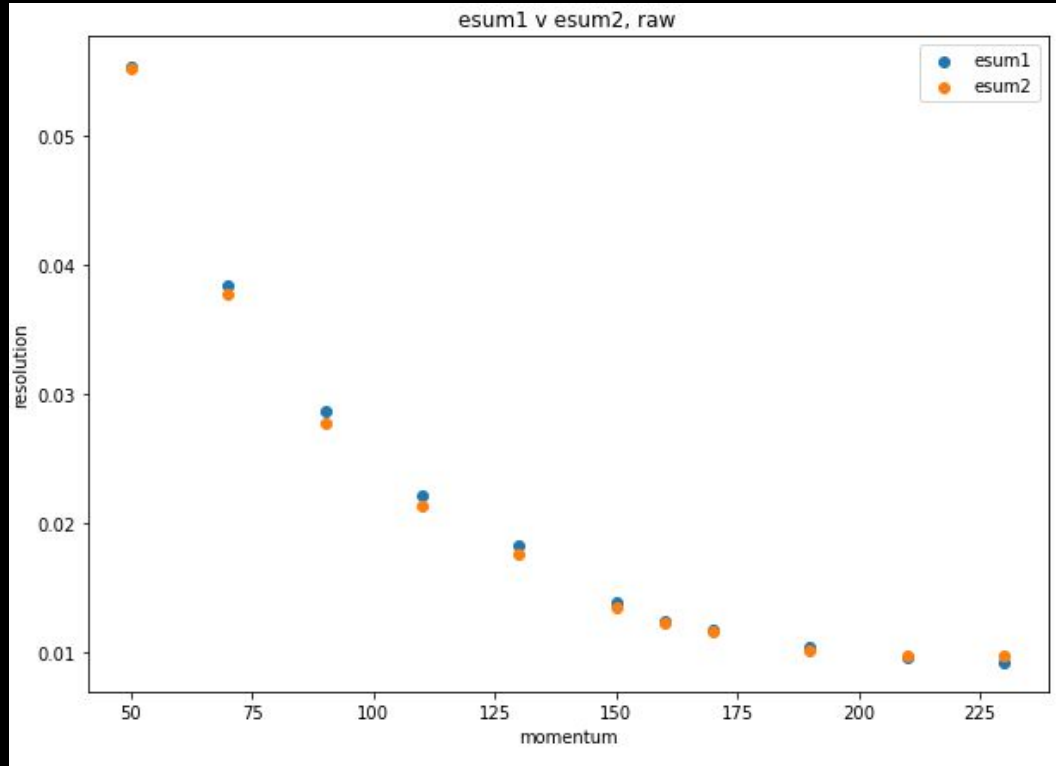
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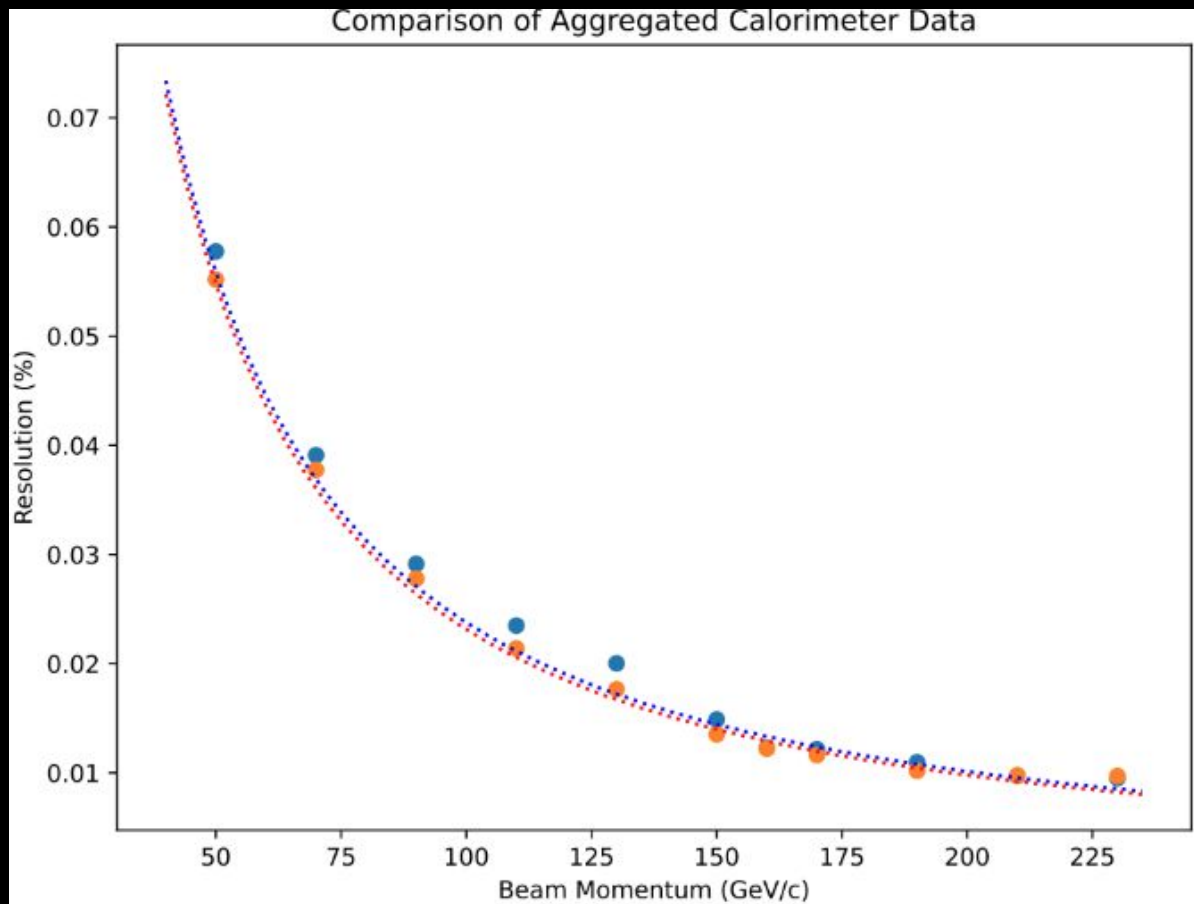




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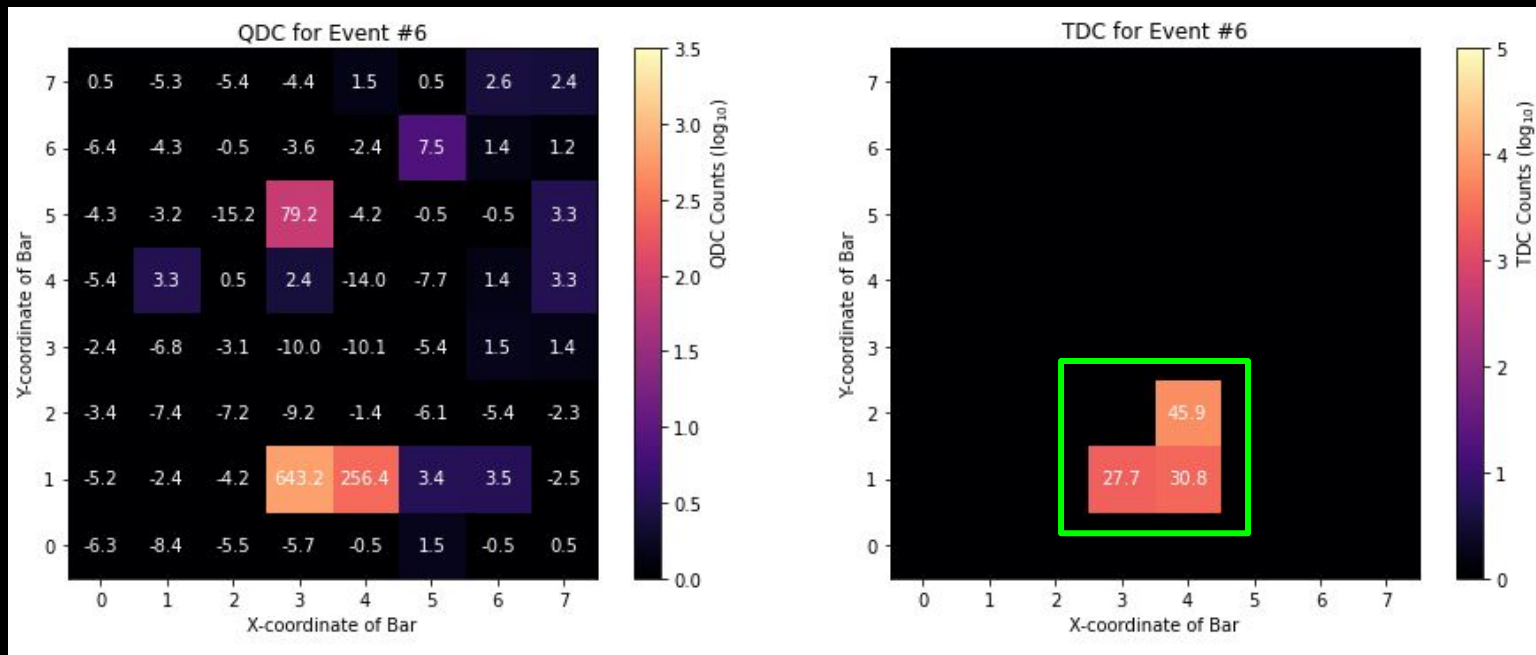
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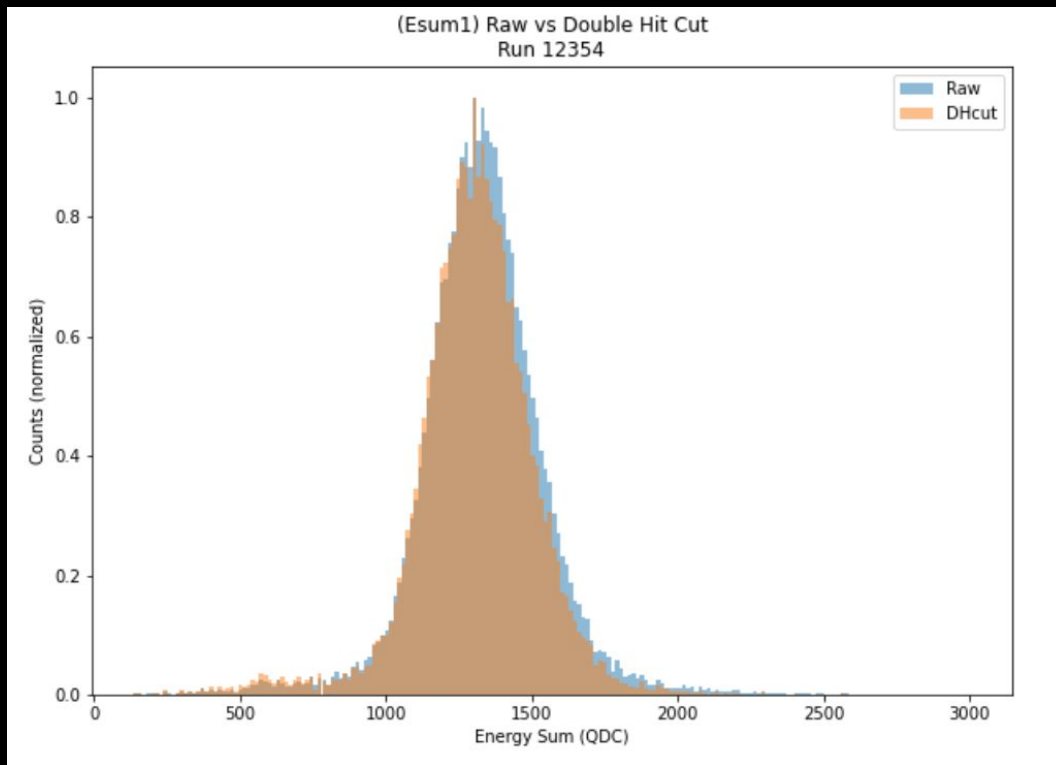
# Adjustment 2: “DHcut”

Removing events with large  
TDC differences



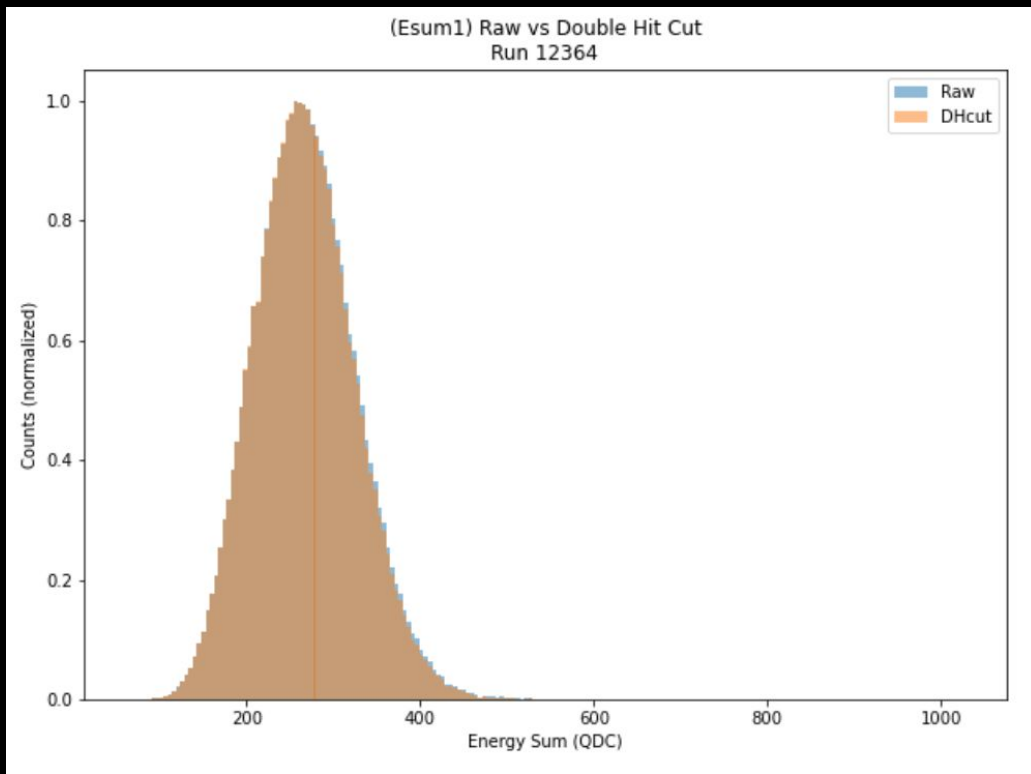
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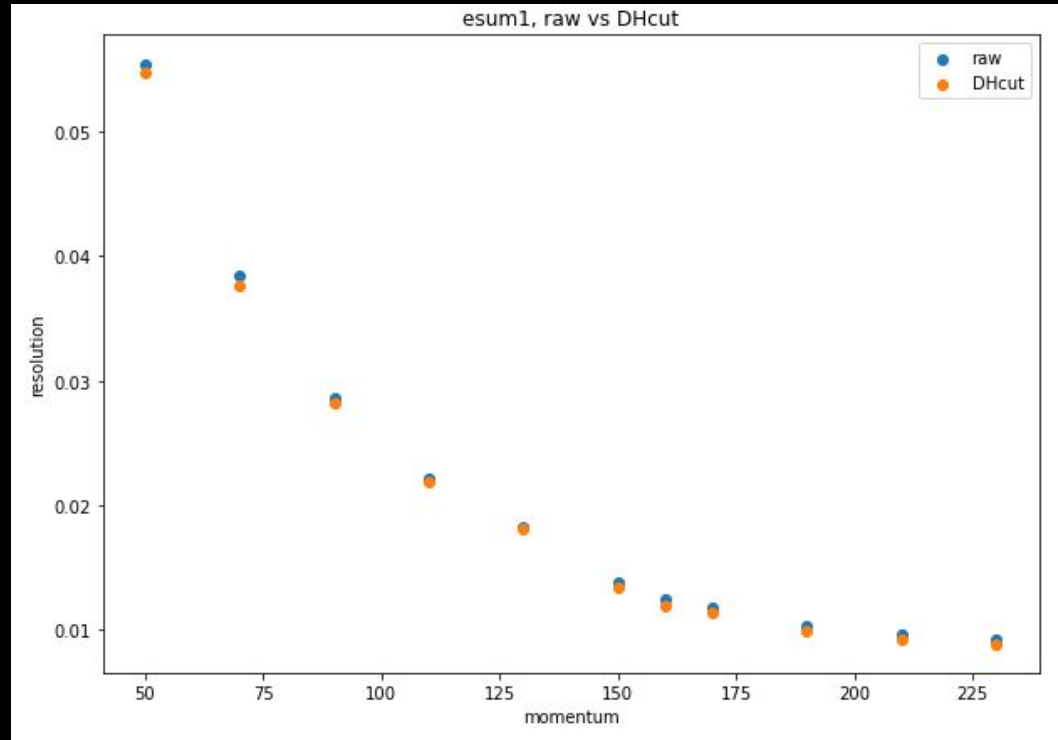
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(Esum1) Raw vs Double Hit Cut  
Run 12364

