dE/dx truncation
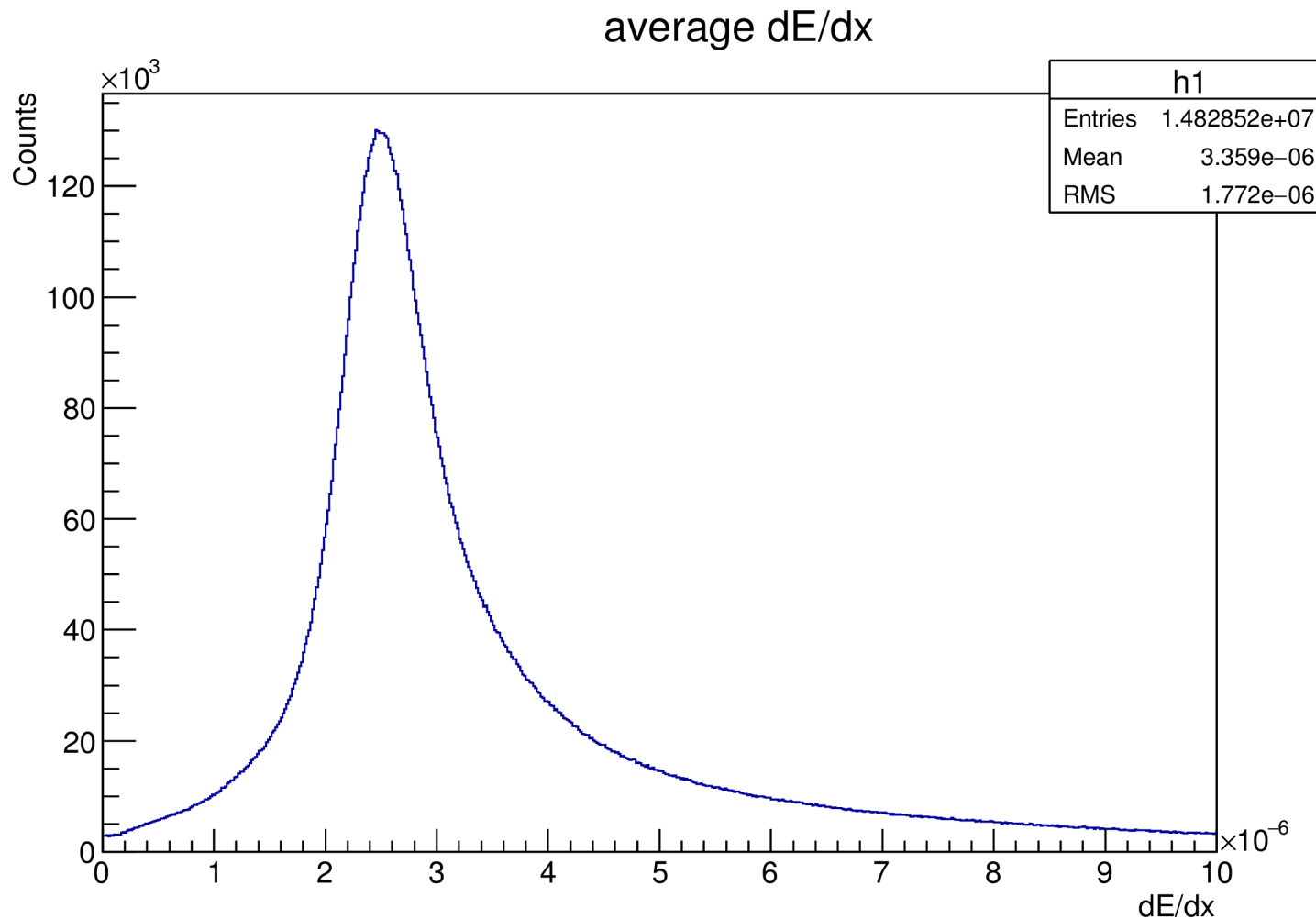
Abdennacer Hamdi

Production & analysis meeting
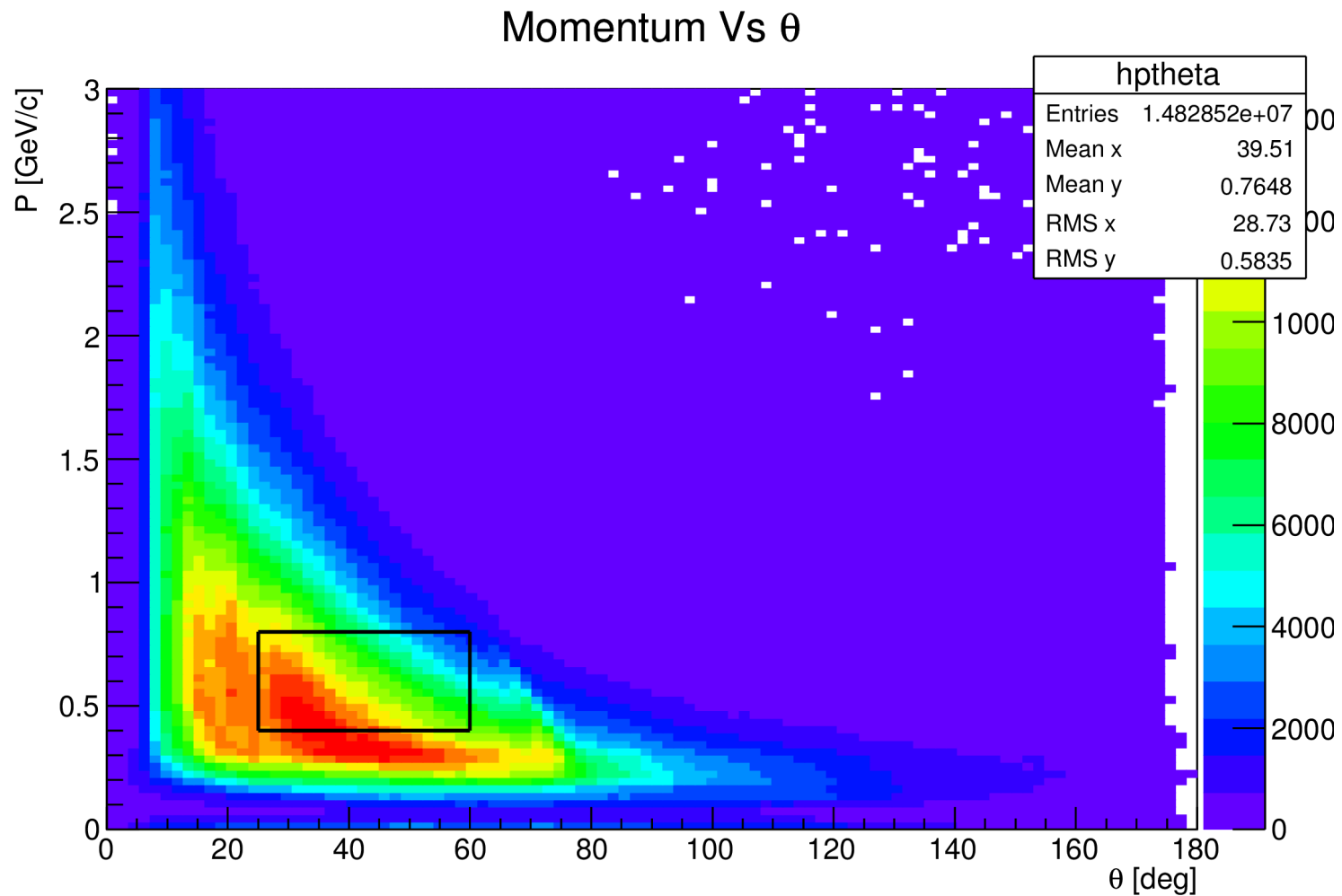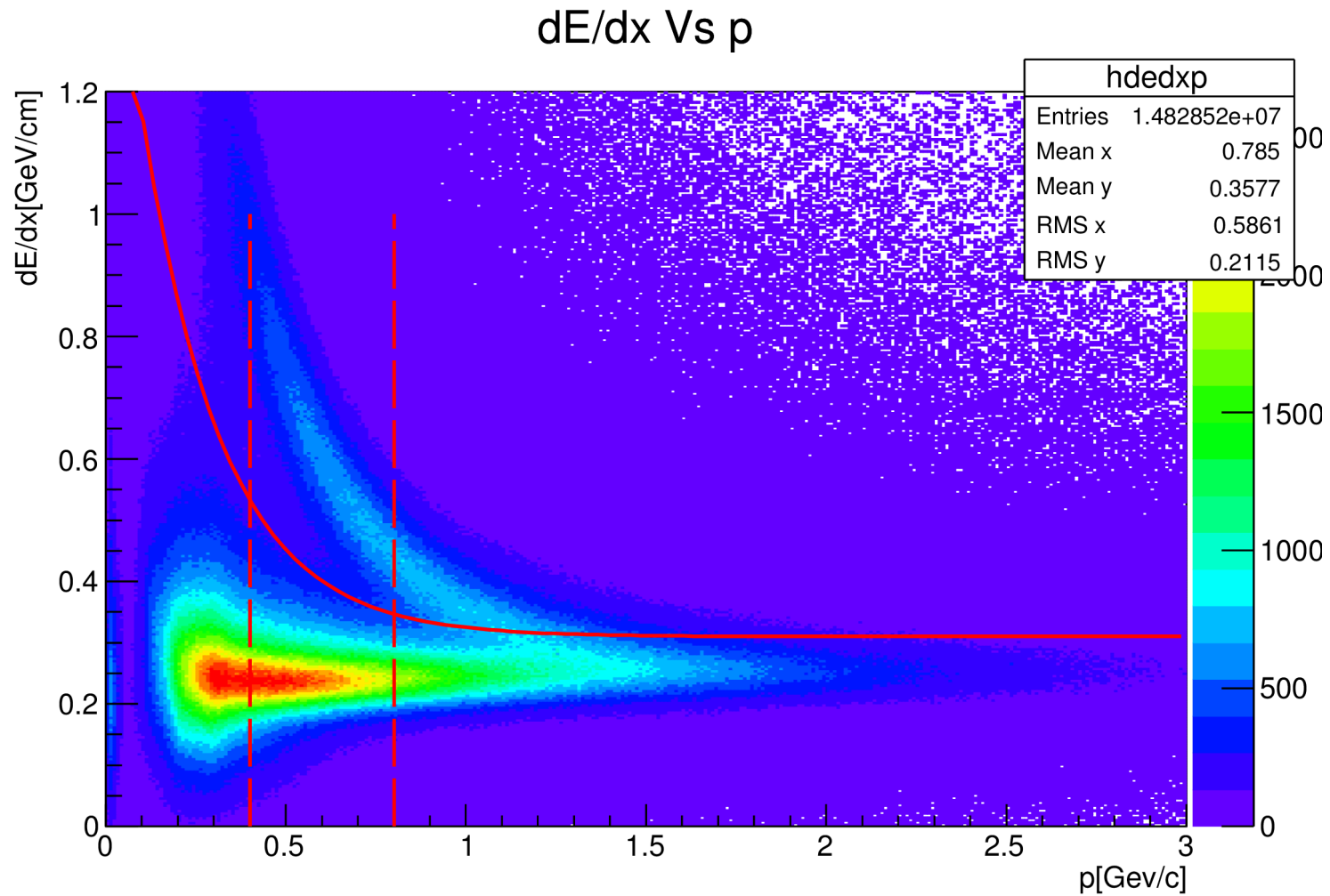
April 19, 2017

- **Problem**: Not possible to define the mean & resolution => PID

- **Solution**: cut some hits away → Truncation

  - In this case, we cut away the hits with most dE/dx

average dE/dx

- 4 files of 2016 data.

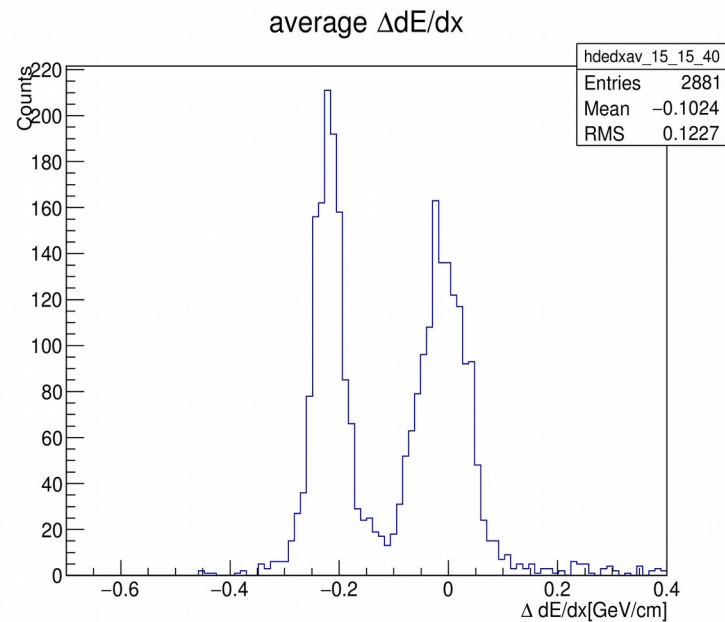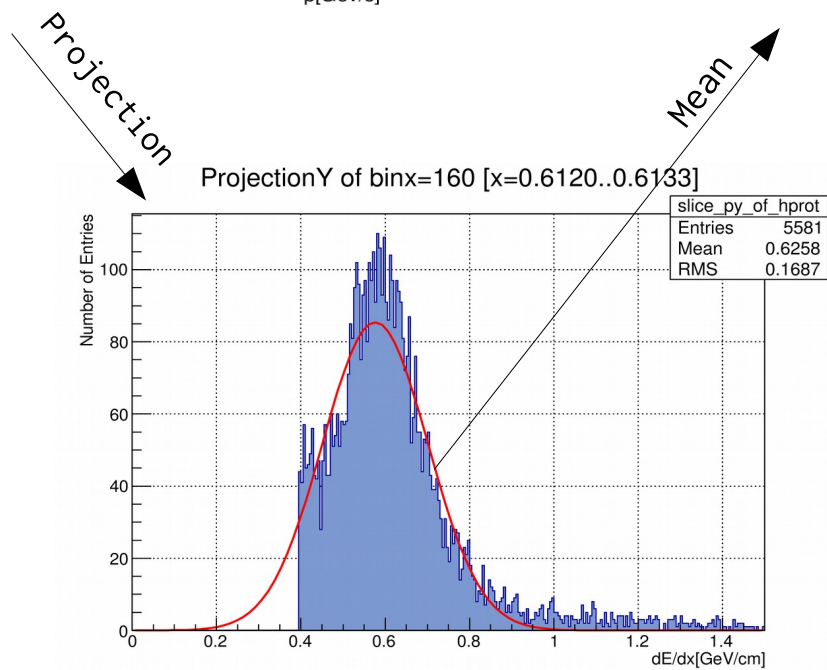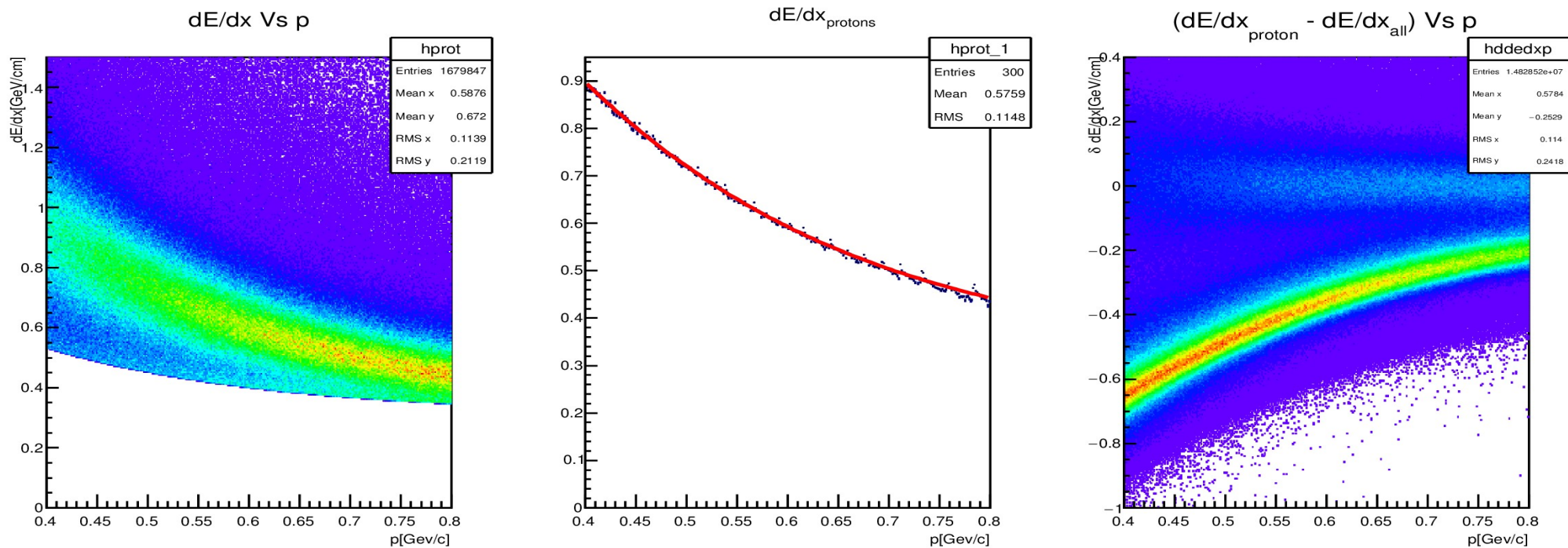- Hits in the CDC

- Truncation dependence on P & θ

Momentum Vs θ

- 1ˢᵗ Step: Select the protons.

dE/dx Vs p

- 2nd step: extract the expected dE/dx for protons

- 1st method: best resolution => optimal truncation.
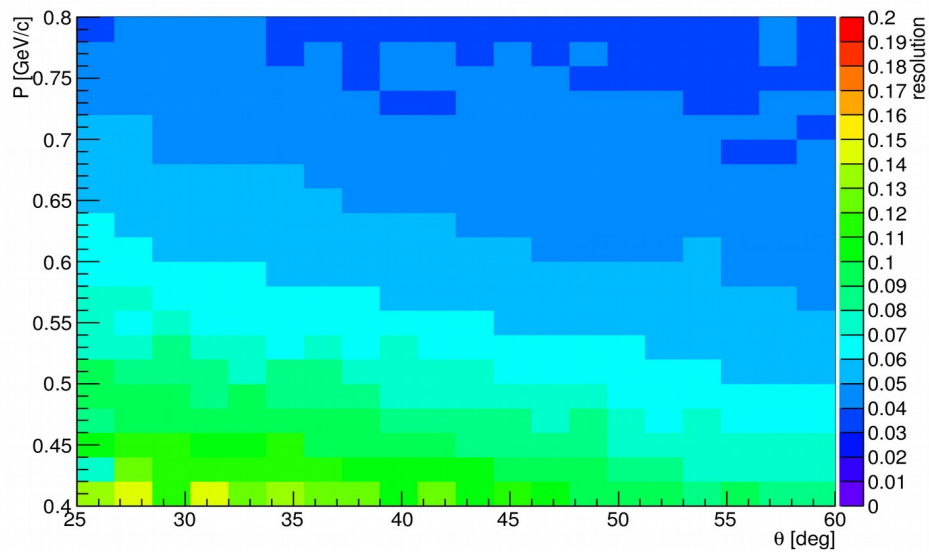

average dE/dx

Momentum vs. θ vs.resolution
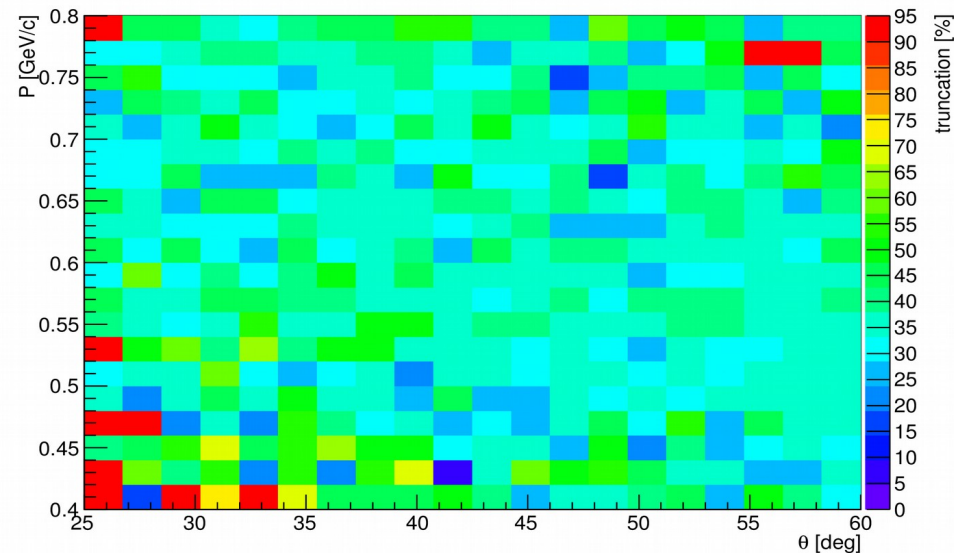
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- 1ˢᵗ method: best resolution => optimal truncation.
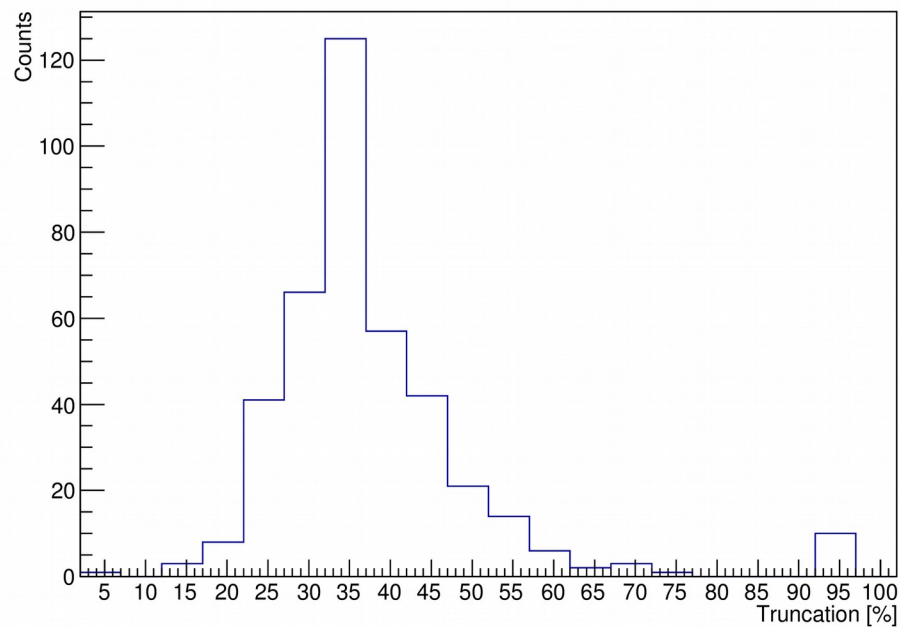
- 1ˢᵗ method: optimal truncation ~35%
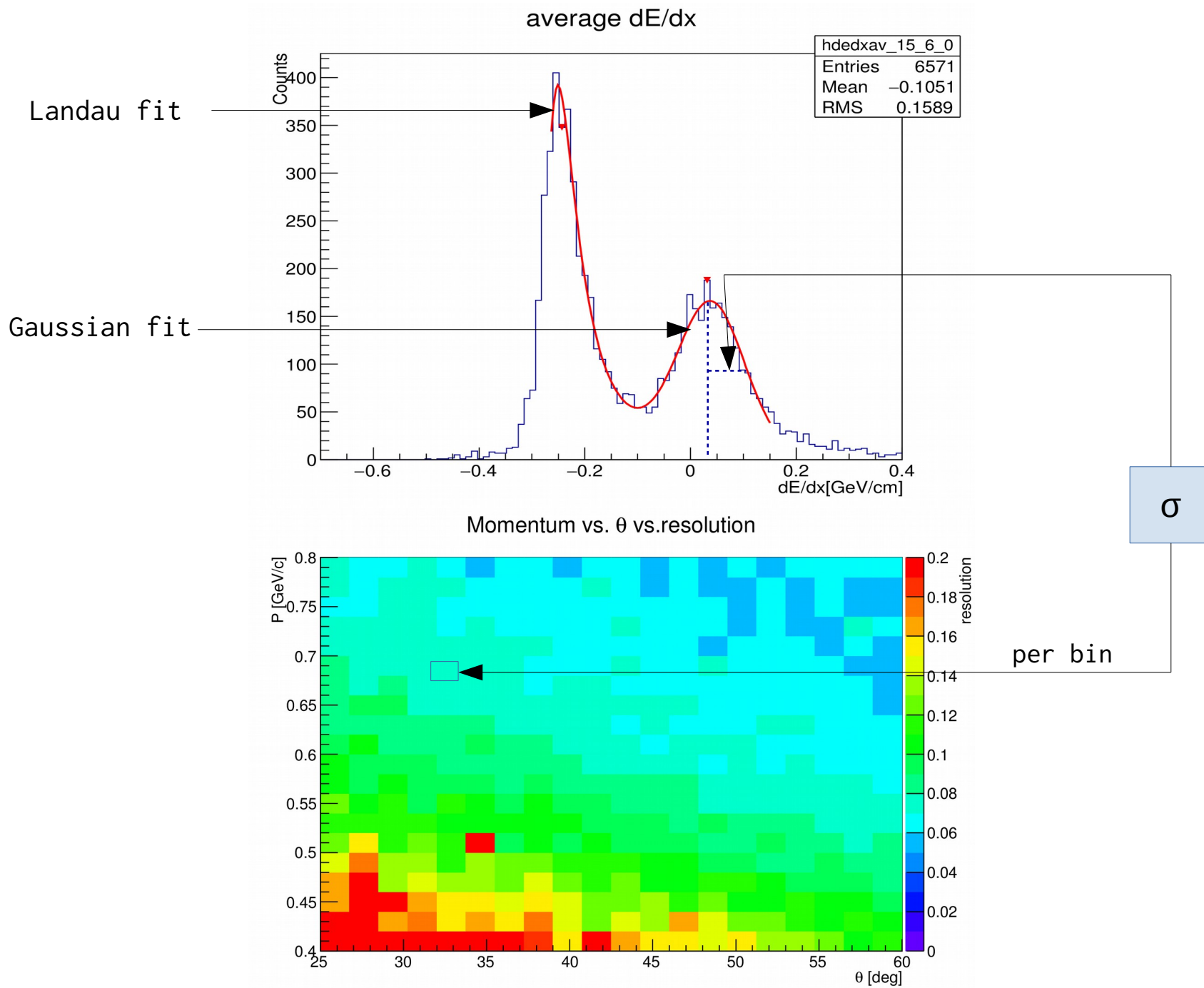
Momentum vs. θ vs. optimal resolution

Momentum vs. θ vs. optimal truncation (resolution)

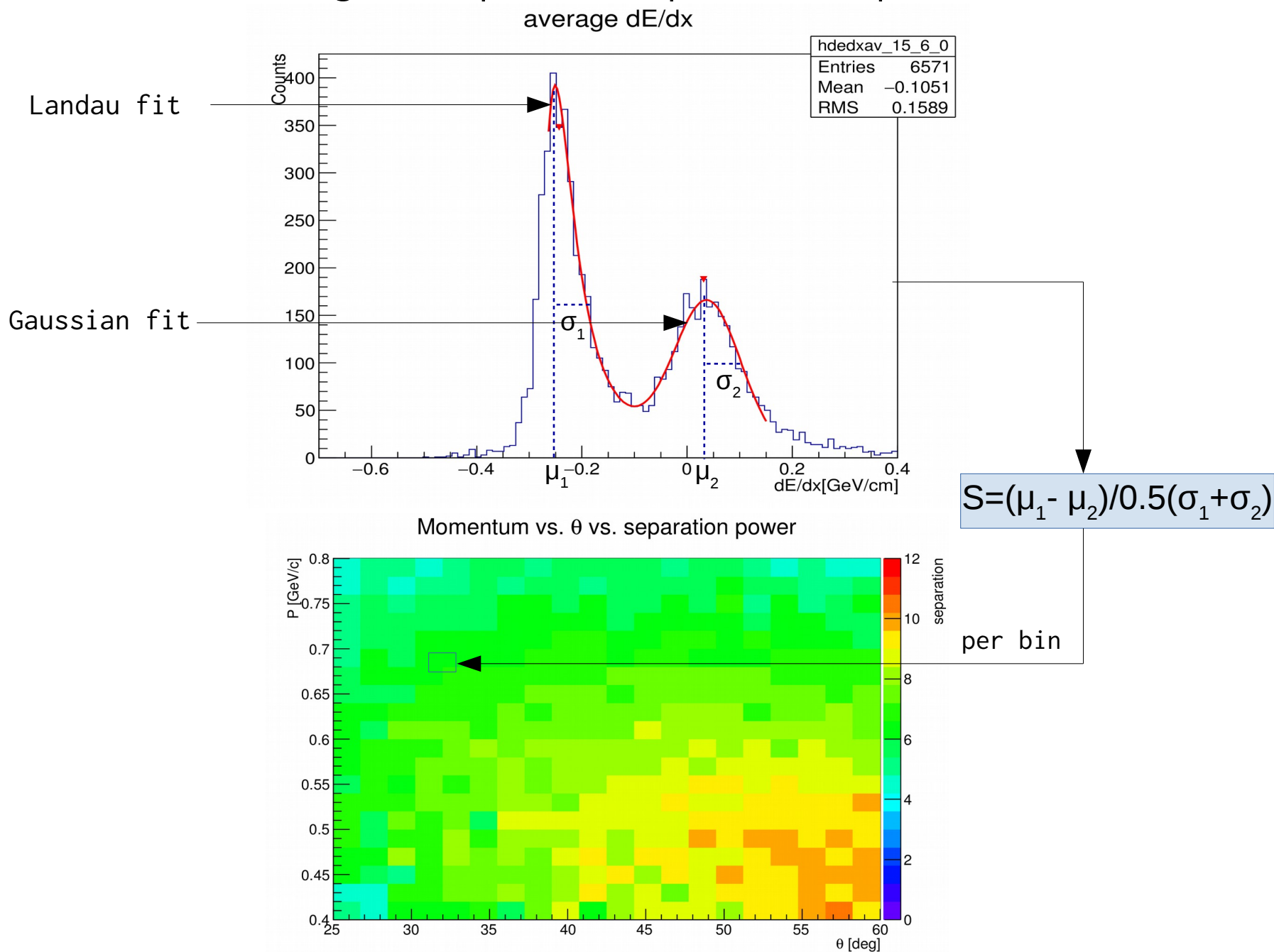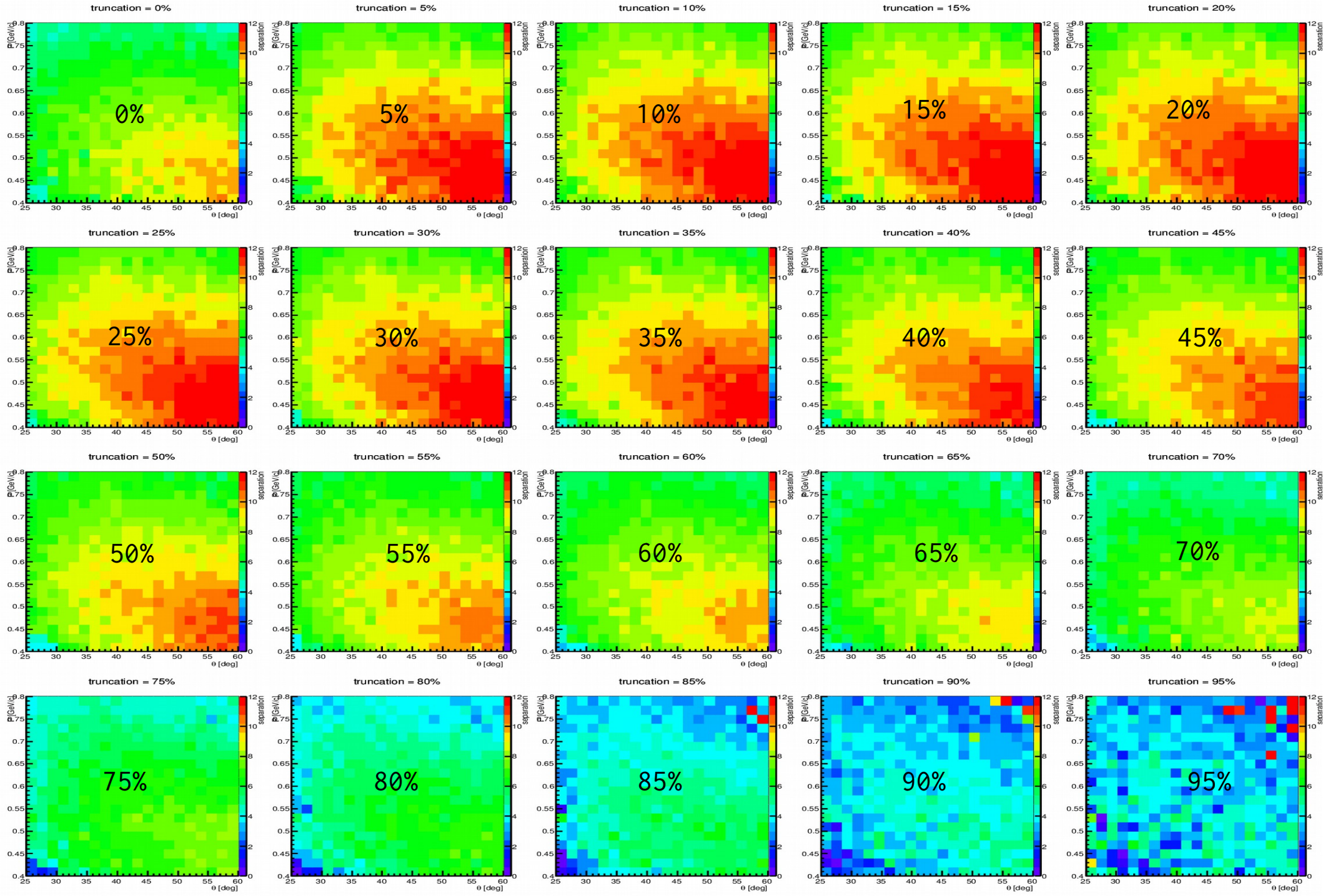optimal truncation (based on resolution)

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- 2nd method: strongest separation power => optimal truncation.

average dE/dx

Landau fit

Gaussian fit

σ_1

σ_2

μ_1 μ_2

dE/dx[GeV/cm]

hdedxav_15_6_0
Entries   6571
Mean   −0.1051
RMS   0.1589

Counts

$S=(\mu_1- \mu_2)/0.5(\sigma_1+\sigma_2)$

Momentum vs. θ vs. separation power

per bin

P [GeV/c]

separation

θ [deg]

Separation Power
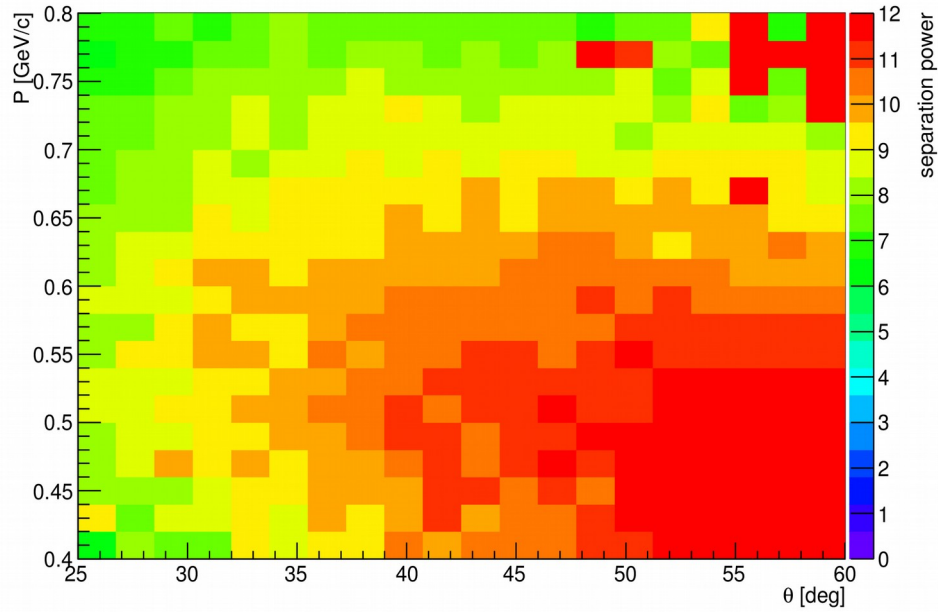
- 2nd method: strongest separation power => optimal truncation.
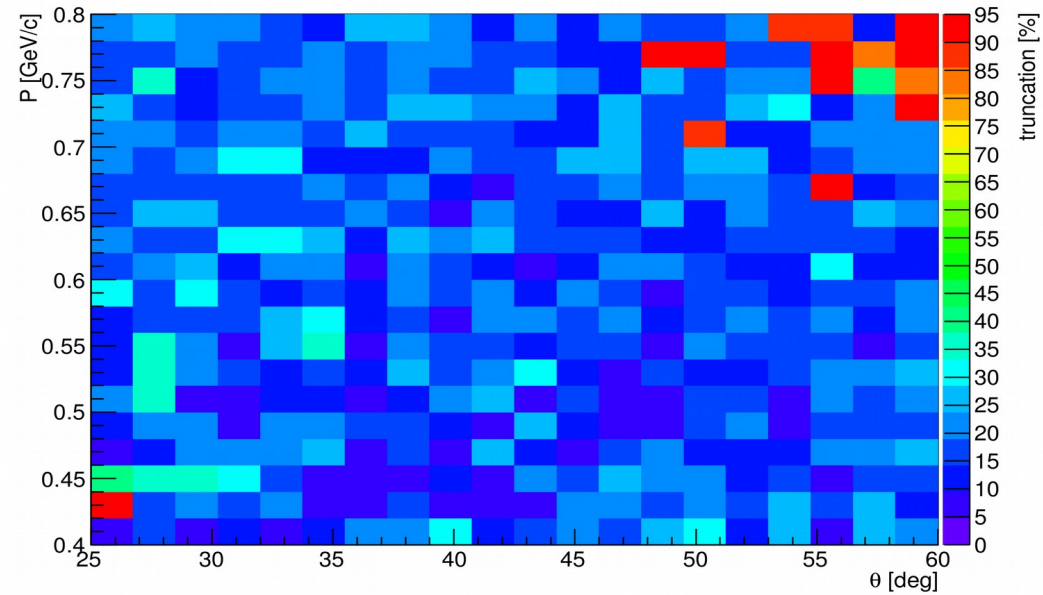
- 2nd method: optimal truncation ~15%
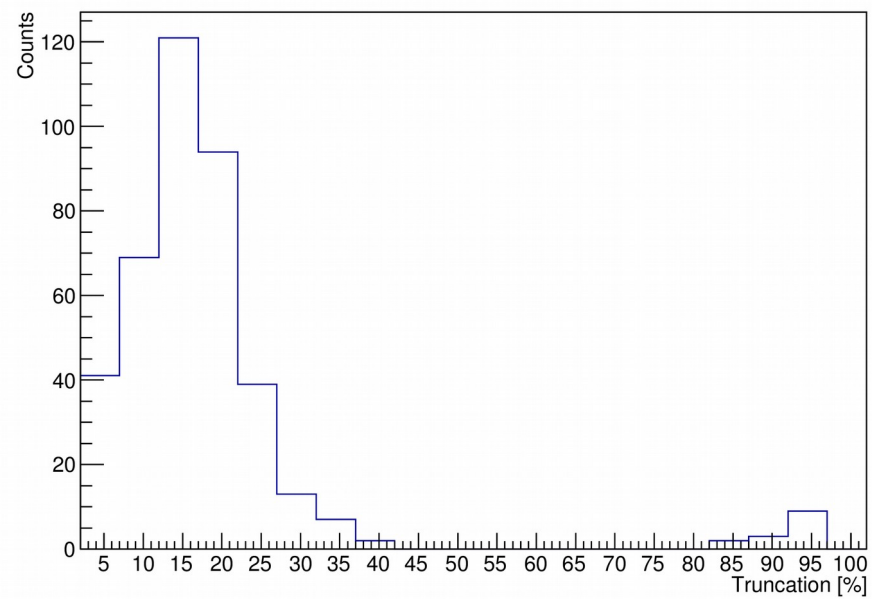
Momentum vs. θ vs. optimal separation power
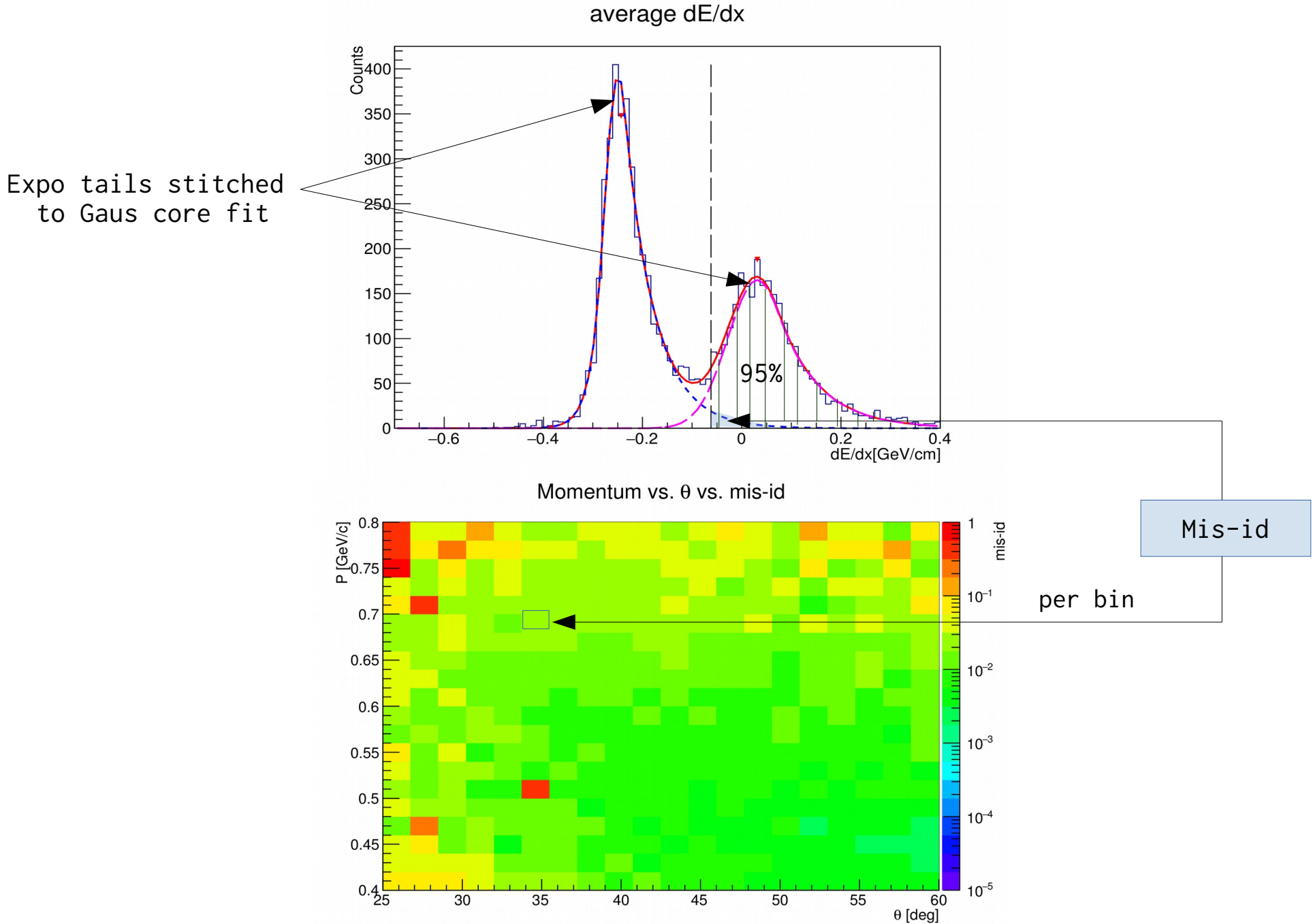

Momentum vs. θ vs. optimal truncation (separation power)

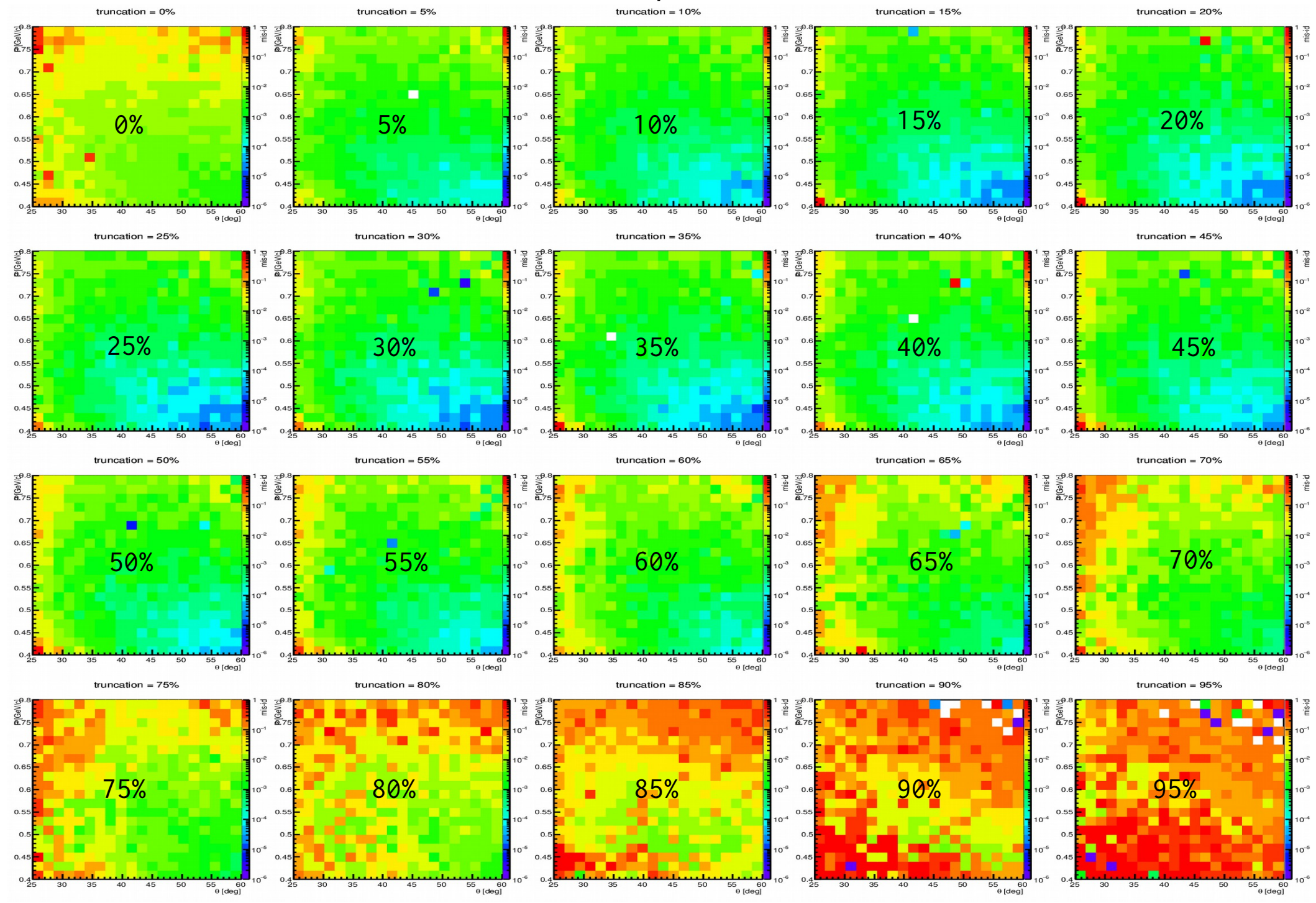optimal truncation (based on separation power)

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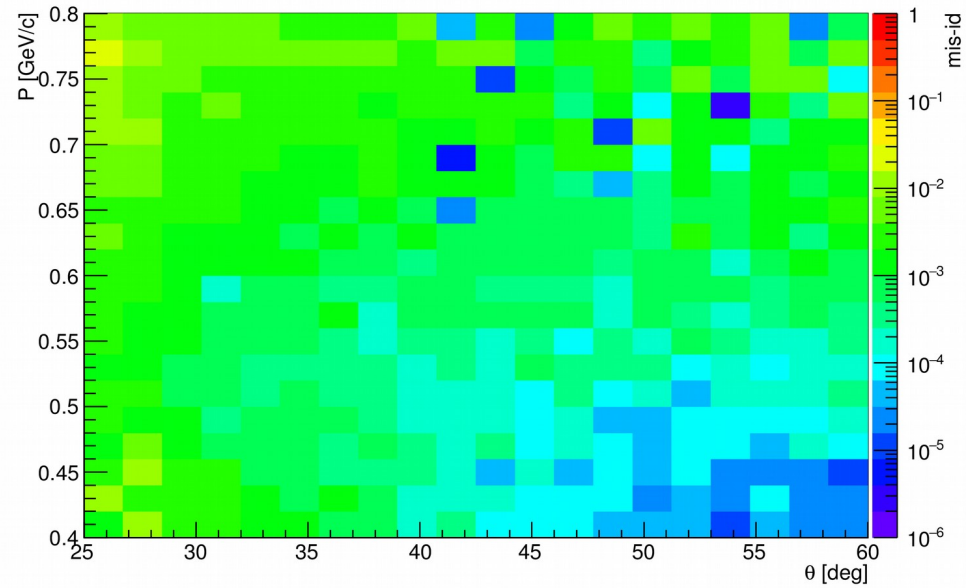- 3rd method: lowest mis-id => optimal truncation.

average dE/dx

Expo tails stitched
to Gaus core fit

95%

Momentum vs. θ vs. mis-id

Mis-id

per bin

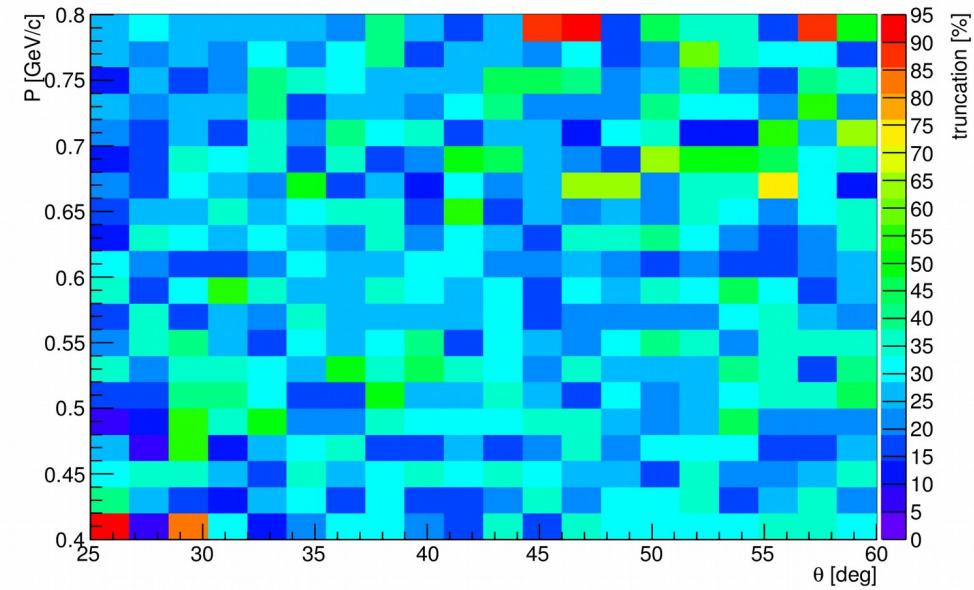- 3rd method: lowest mis-id => optimal truncation.

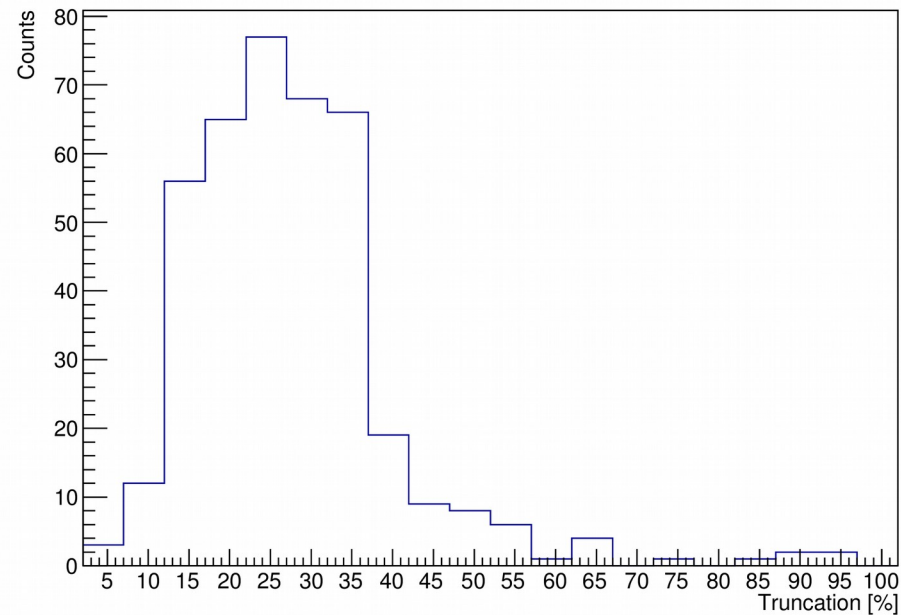- 3ʳᵈ method: optimal truncation ~25%
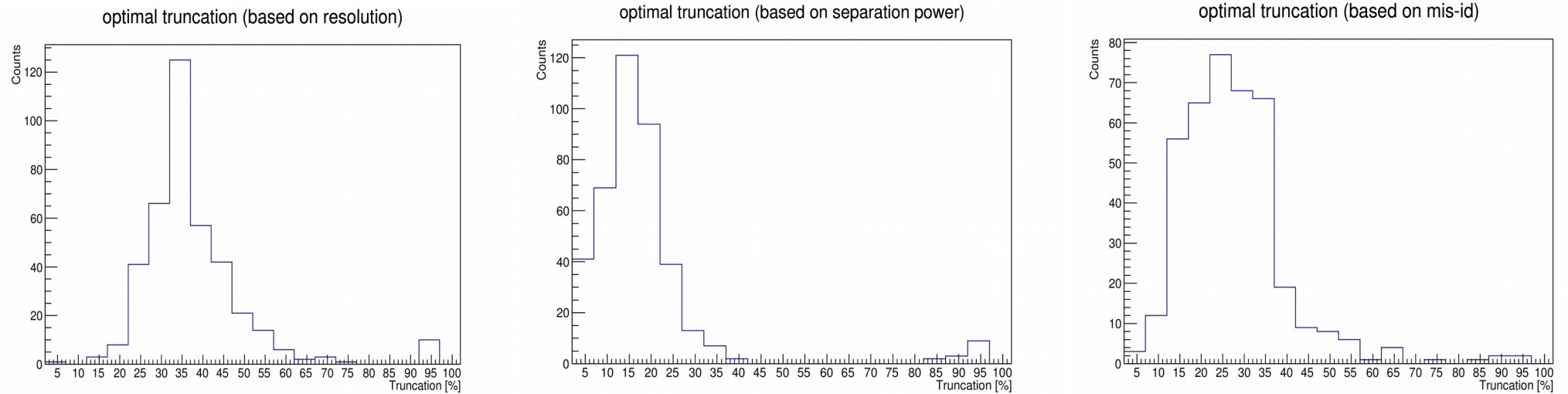
Momentum vs. θ vs. optimal mis-id

Momentum vs. θ vs. optimal truncation (mis-id)

optimal truncation (based on mis-id)

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- The dE/dx Truncations found are different from the currently used one (50%).

- The dE/dx Truncation is different for each classifier.

optimal truncation (based on resolution)

optimal truncation (based on separation power)

optimal truncation (based on mis-id)

<u>Next</u>:

- Study the optimal truncation in exclusive channels.

- Study the double truncation.

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