

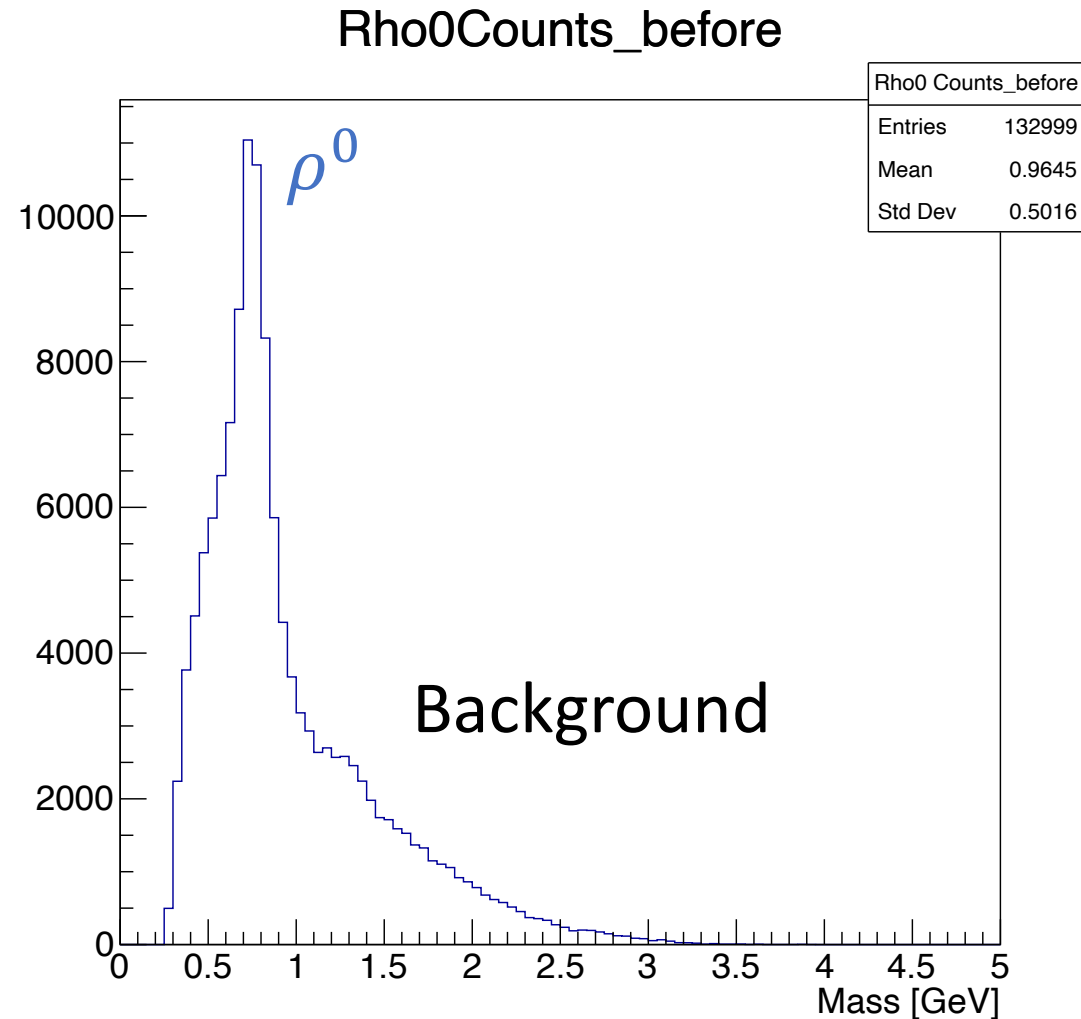
- Reaction:  $\gamma d \rightarrow \pi^+ \pi^- p (n)$
- 1 REST file from deuterium data
- Event Selection:
  - 2 positive and 1 negative track
  - Kinematic fitting with F4 vertex constraint, and confidence level  $> 0.01$
  - tagger accidental subtracted with 4 beam bunches on each side
  - standard GlueX PID cuts (timing and dE/dx)

# Invariant Mass before cuts

$$\gamma d \rightarrow \pi^+ \pi^- p (n)$$

- Cuts Applied

- KFCL > 0.01
- PIDCL > 0.1
- 6 GeV < Ebeam < 10 GeV
- CL > 0.05
- OffTime Subtraction

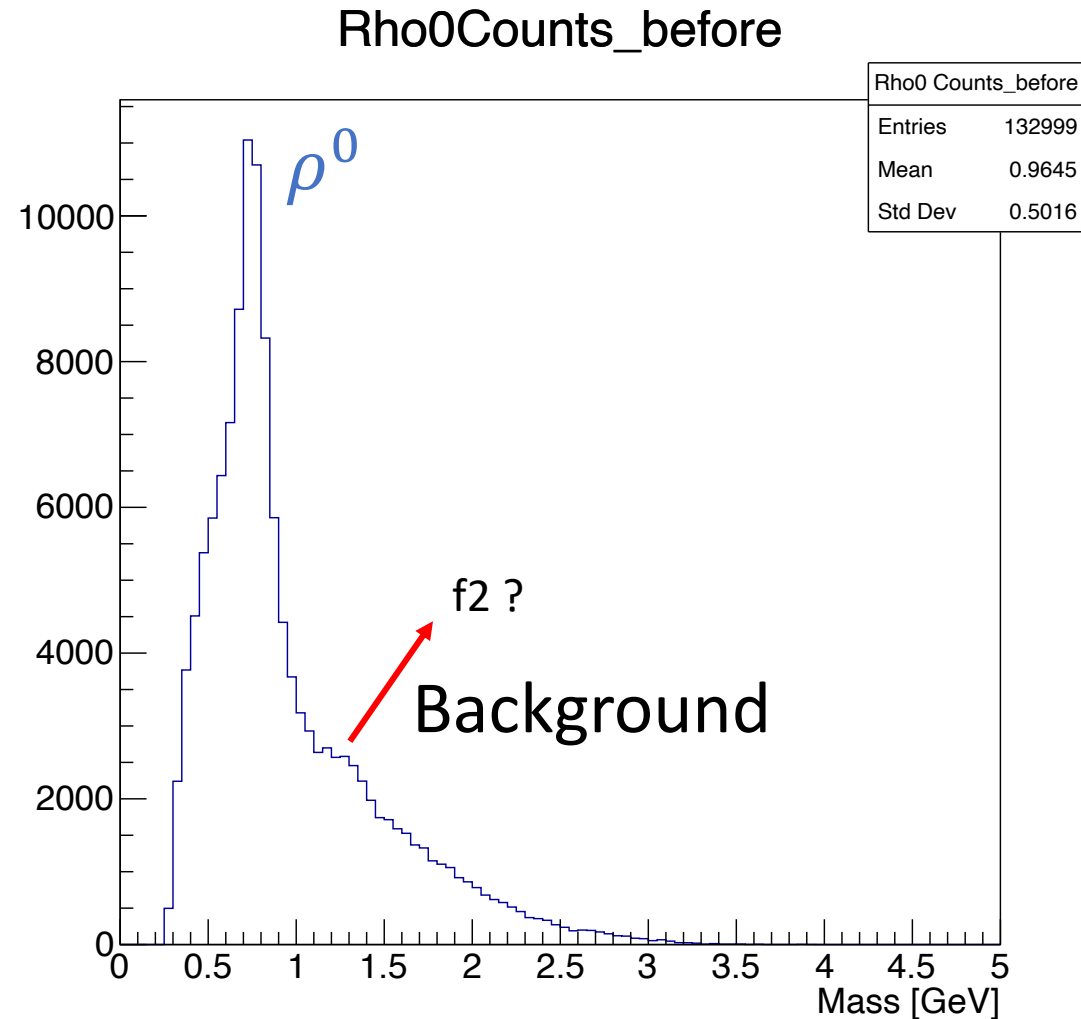


# Invariant Mass before cuts

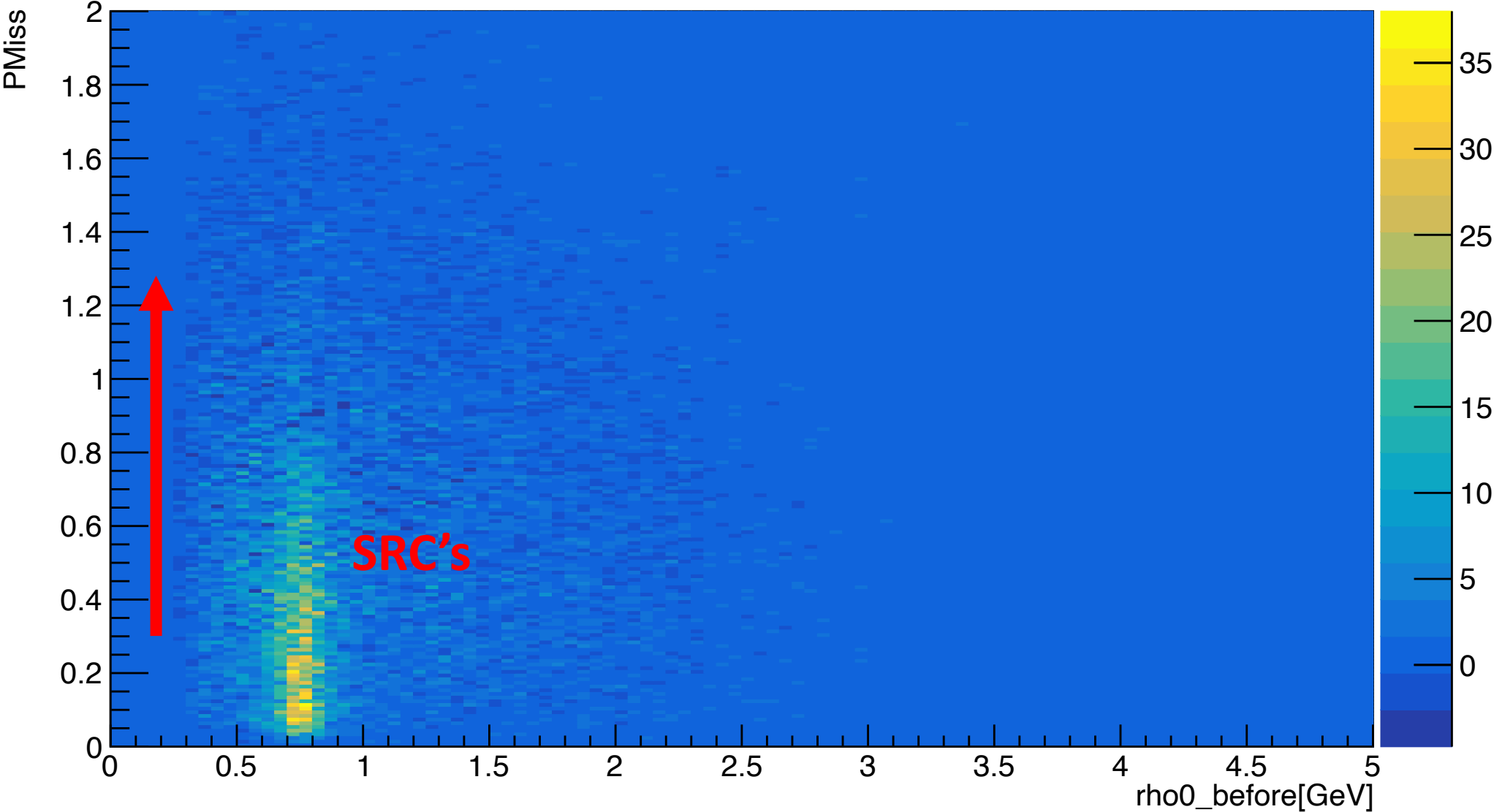
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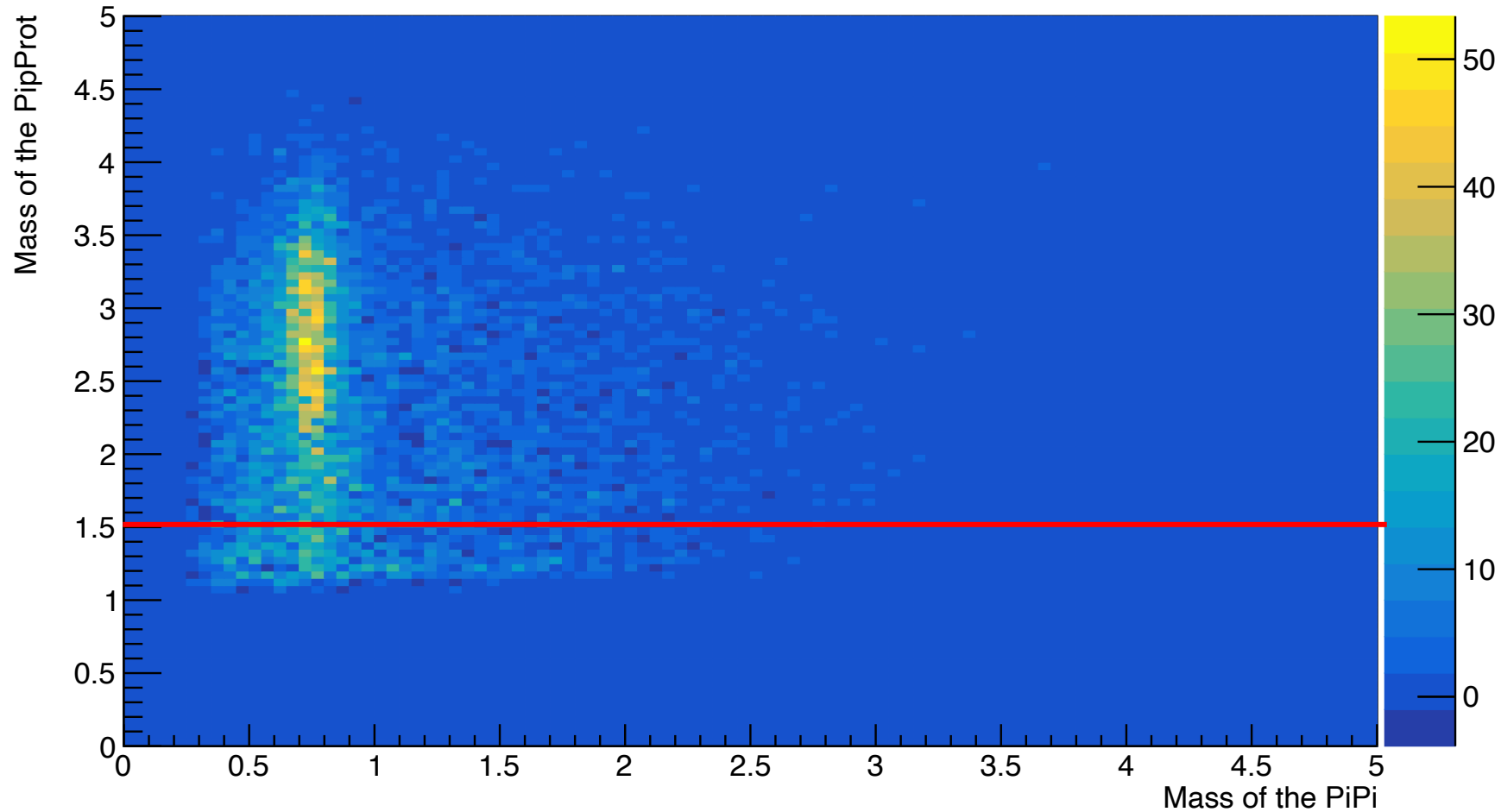


rho0 vs pmiss before

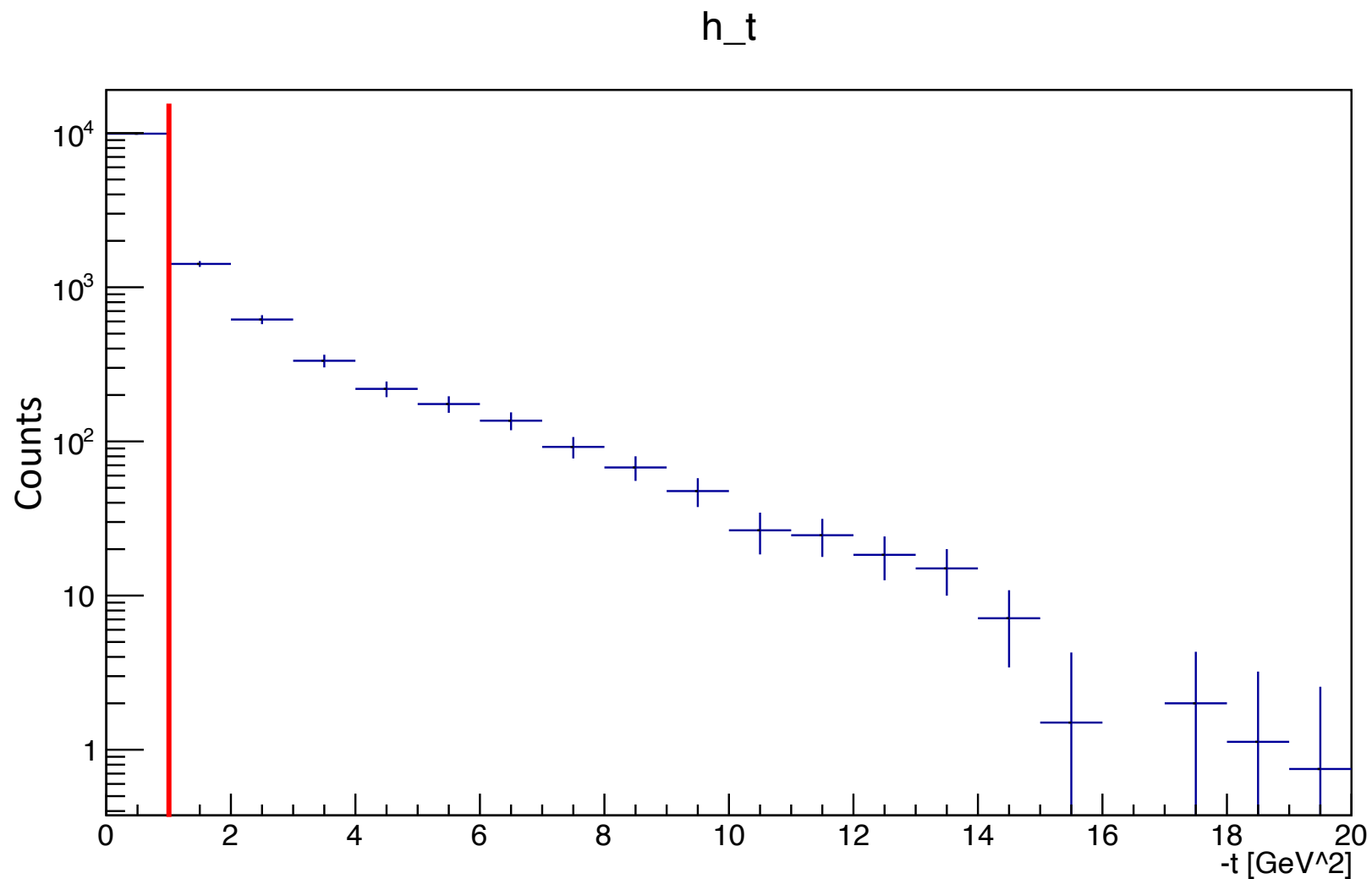


$$M_{\pi^+\pi^-} \text{ vs } M_{\pi^+p} \rightarrow M_{\pi^+p} > 1.5 \text{ GeV}$$

Dalitz



# High Momentum Transfer $\rightarrow |t| > 1$

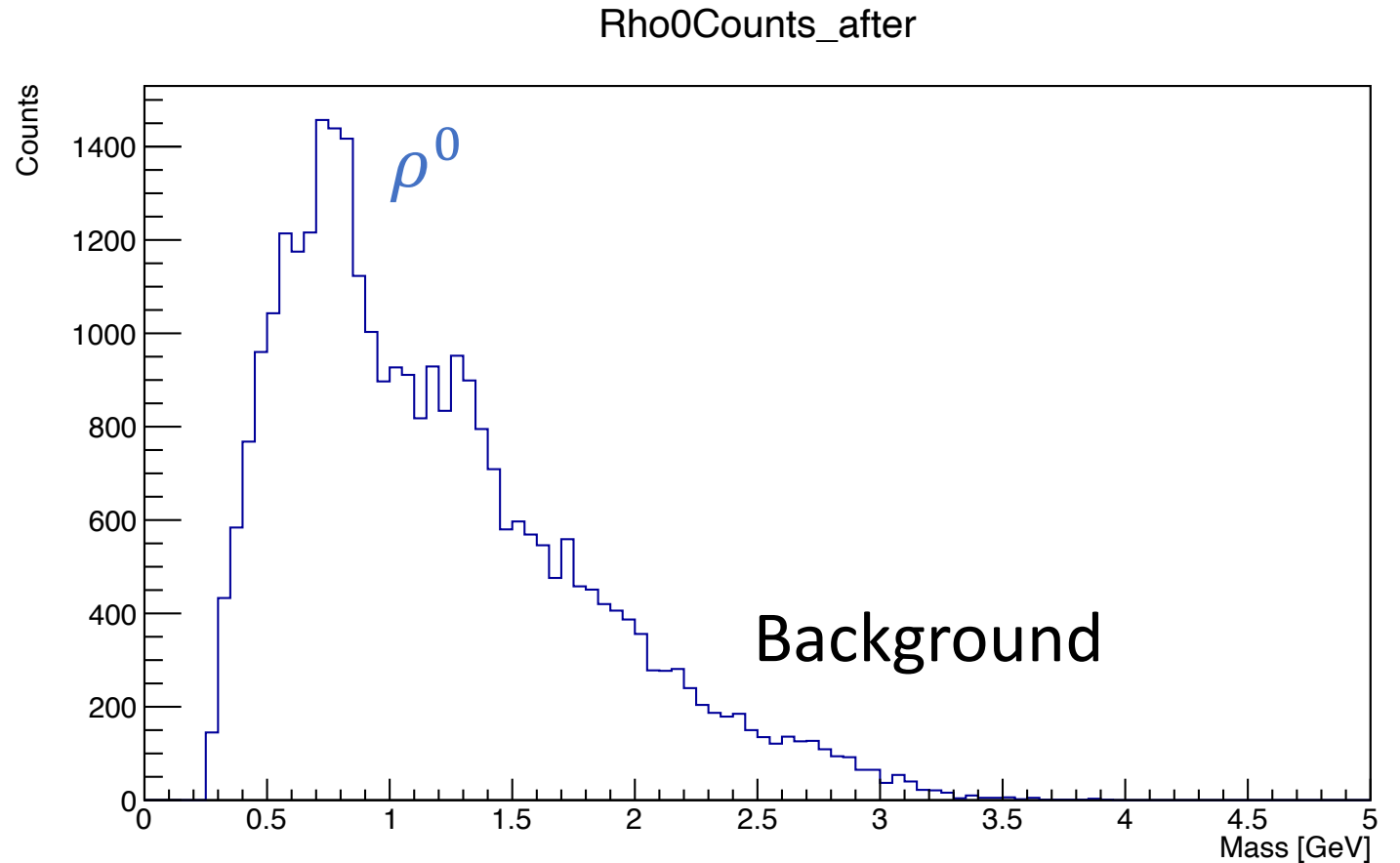


# Invariant Mass after cuts

$$\gamma d \rightarrow \pi^+ \pi^- p (n)$$

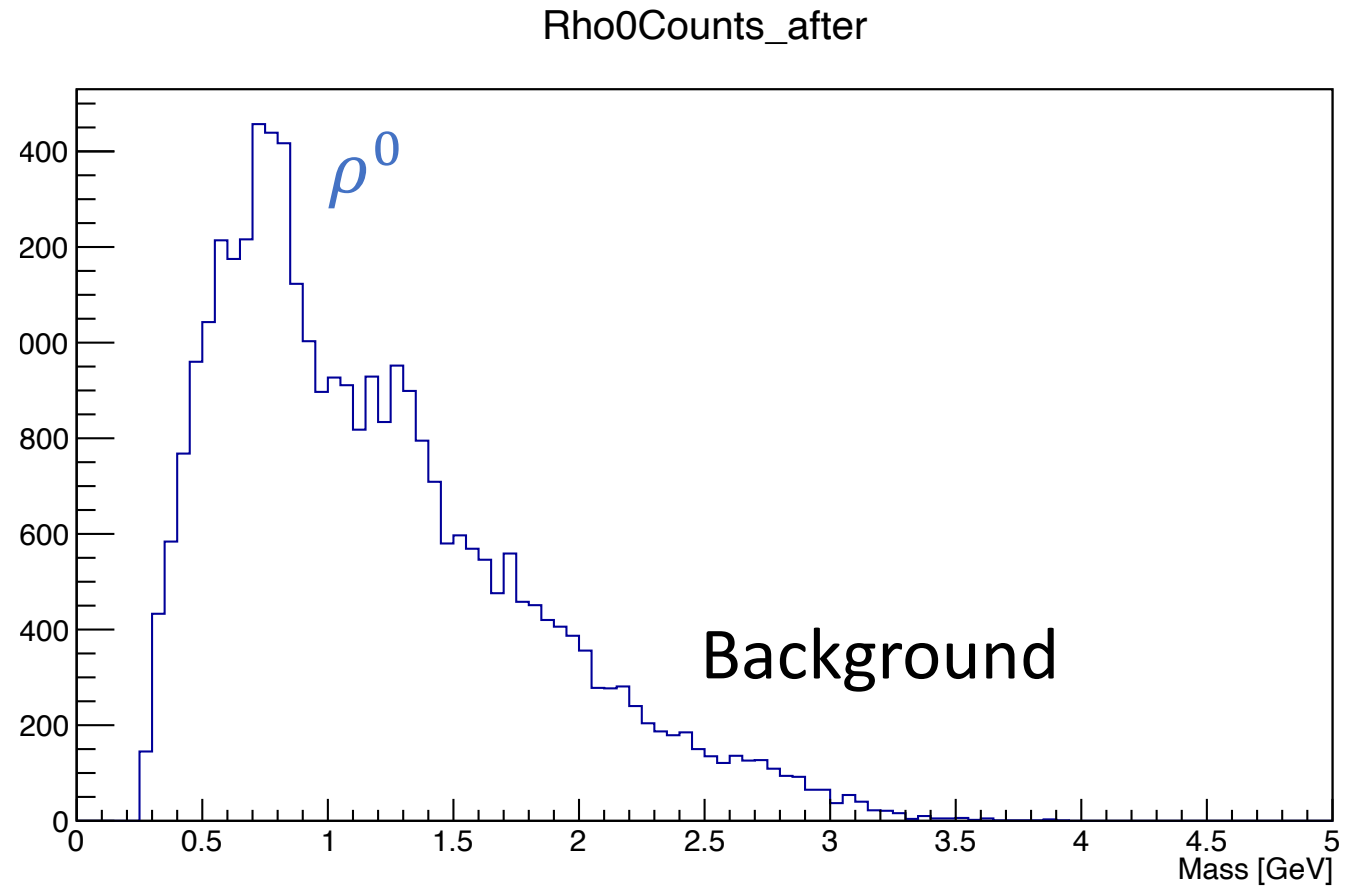
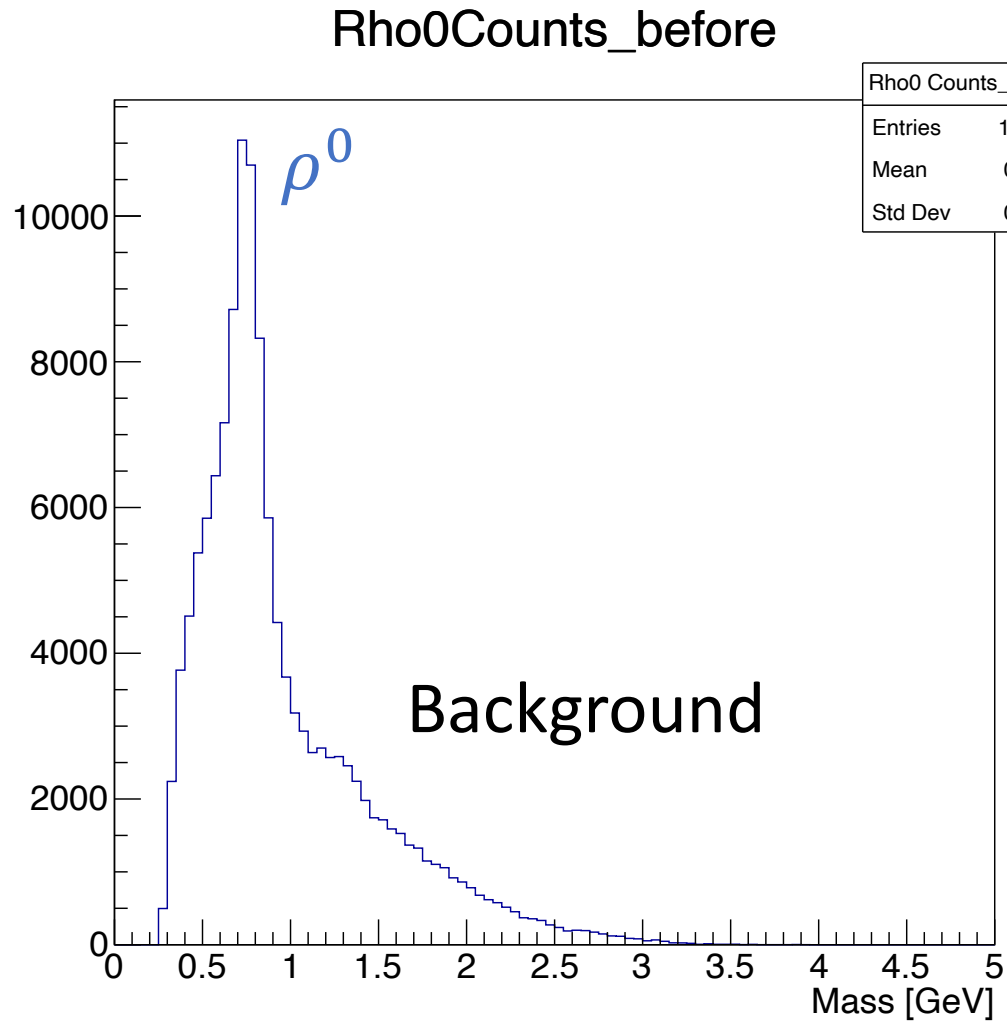
- Cuts Applied

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- $M_{\pi^+ p} > 1.5$
- $|t| > 1$



# Invariant Mass

$$\gamma d \rightarrow \pi^+ \pi^- p (n)$$



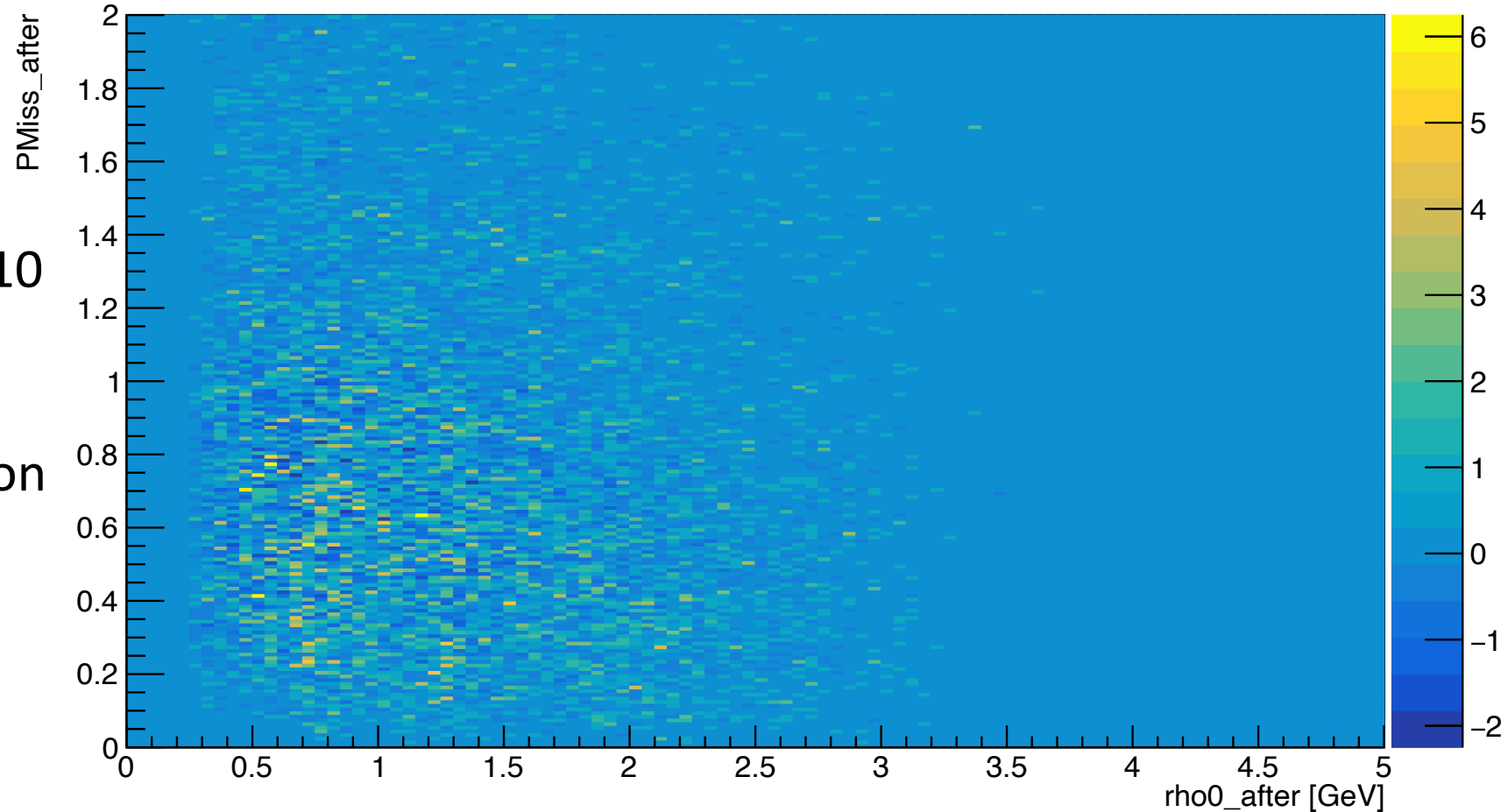


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rho0 vs pmiss after

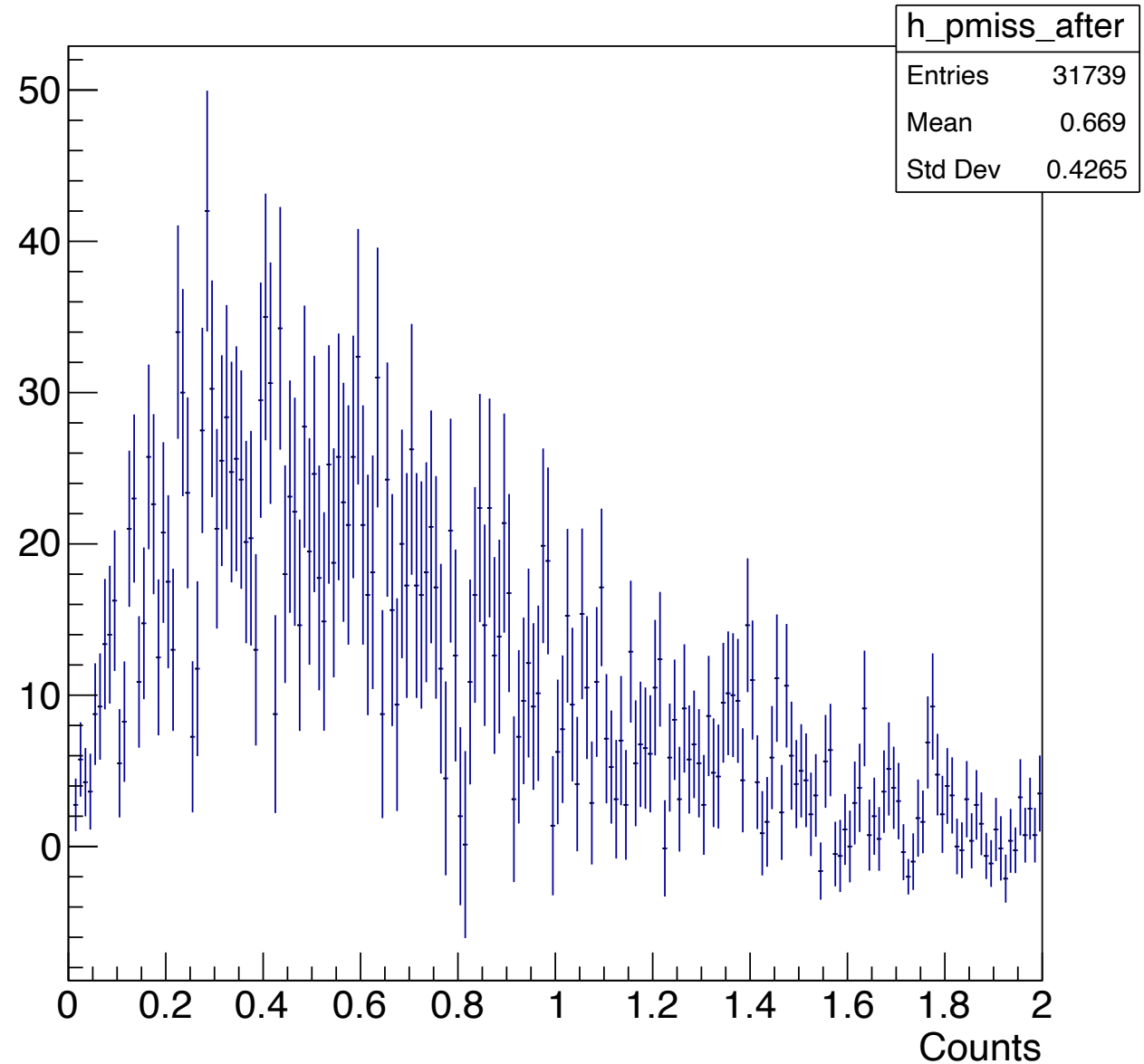


## Missing Momentum [GeV]

$$\gamma d \rightarrow \pi^+ \pi^- p(n)$$

- Cuts Applied

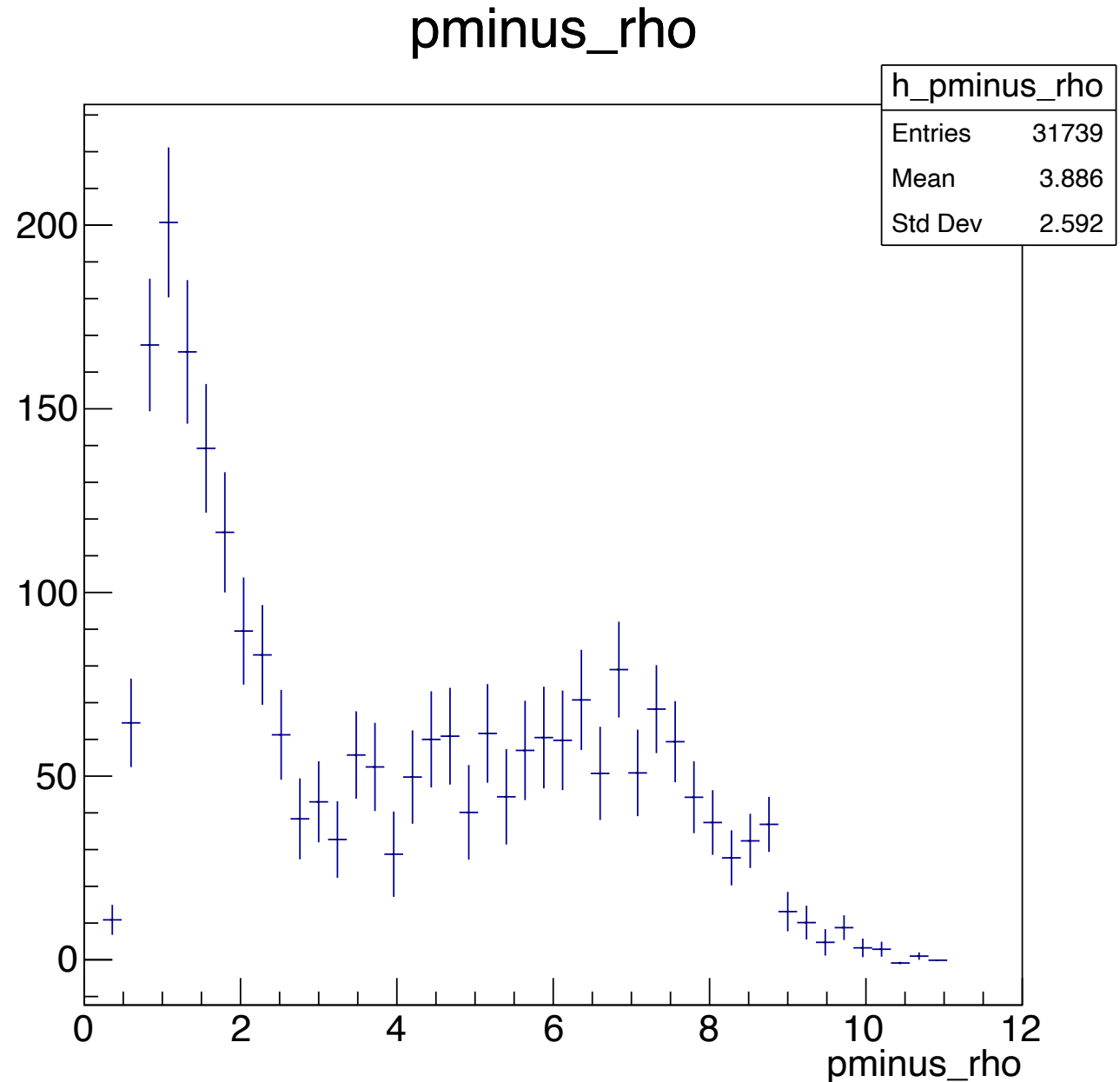
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$$\gamma d \rightarrow \pi^+ \pi^- p(n)$$

- Cuts Applied

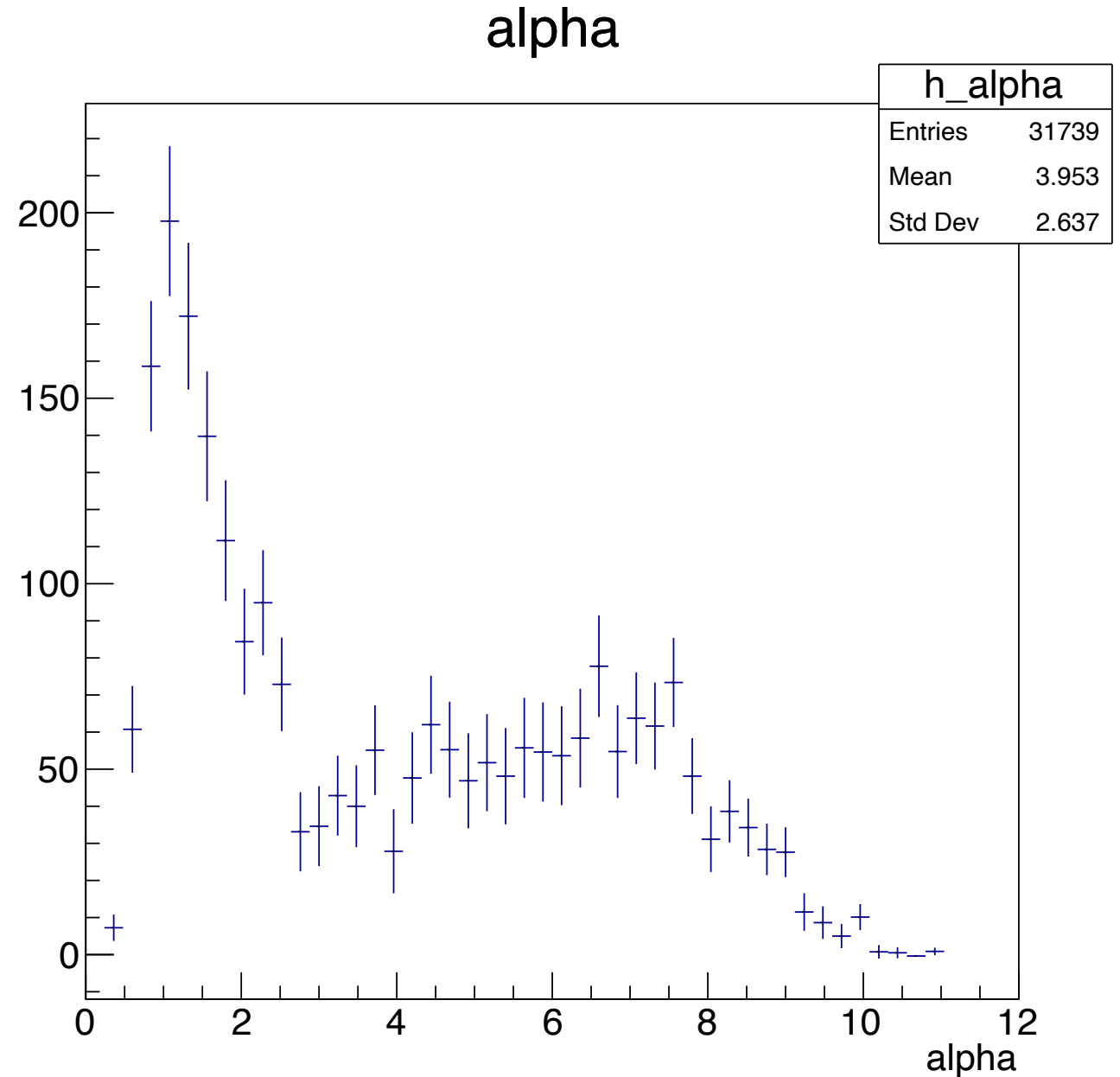
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- Cuts Applied

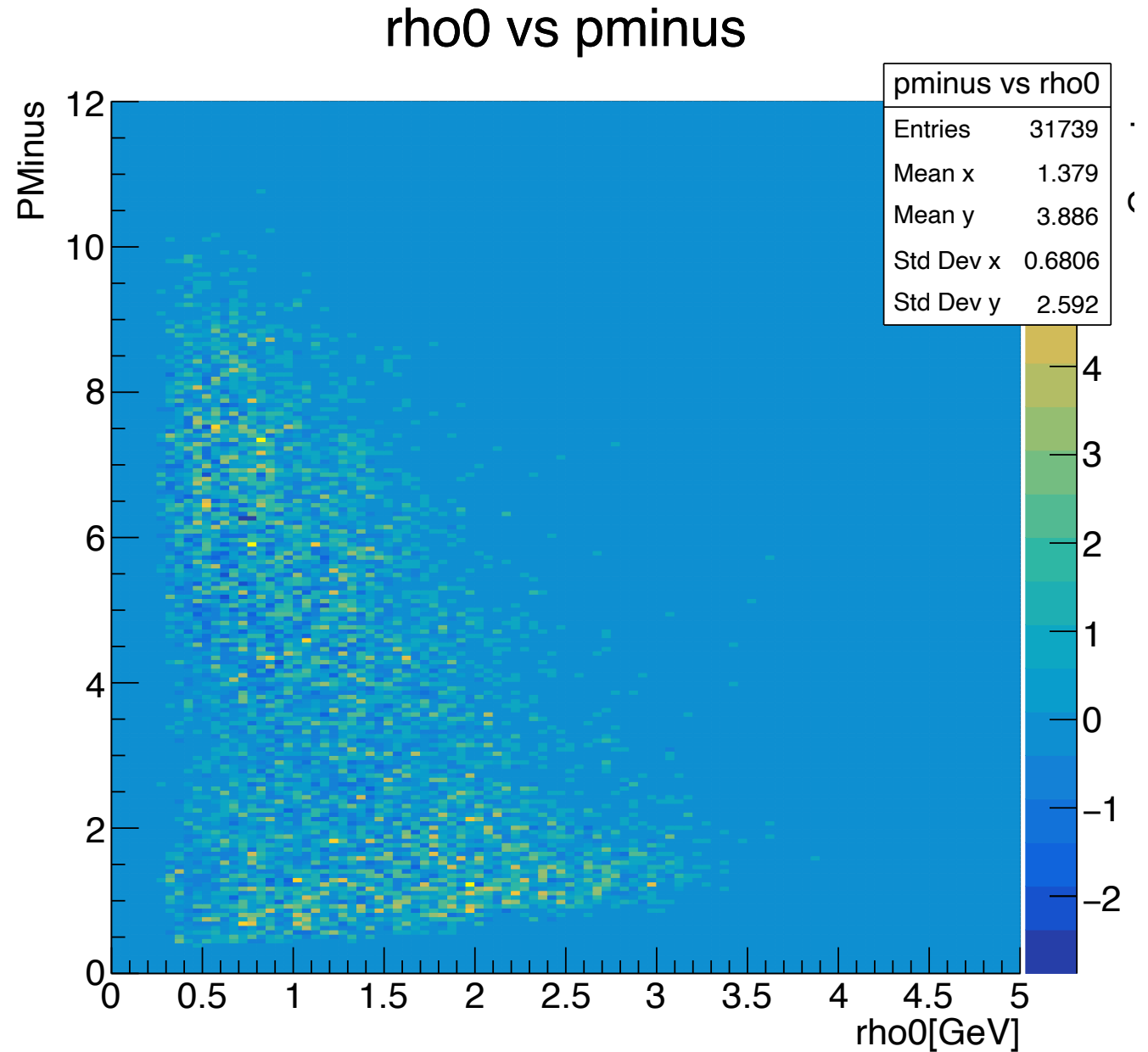
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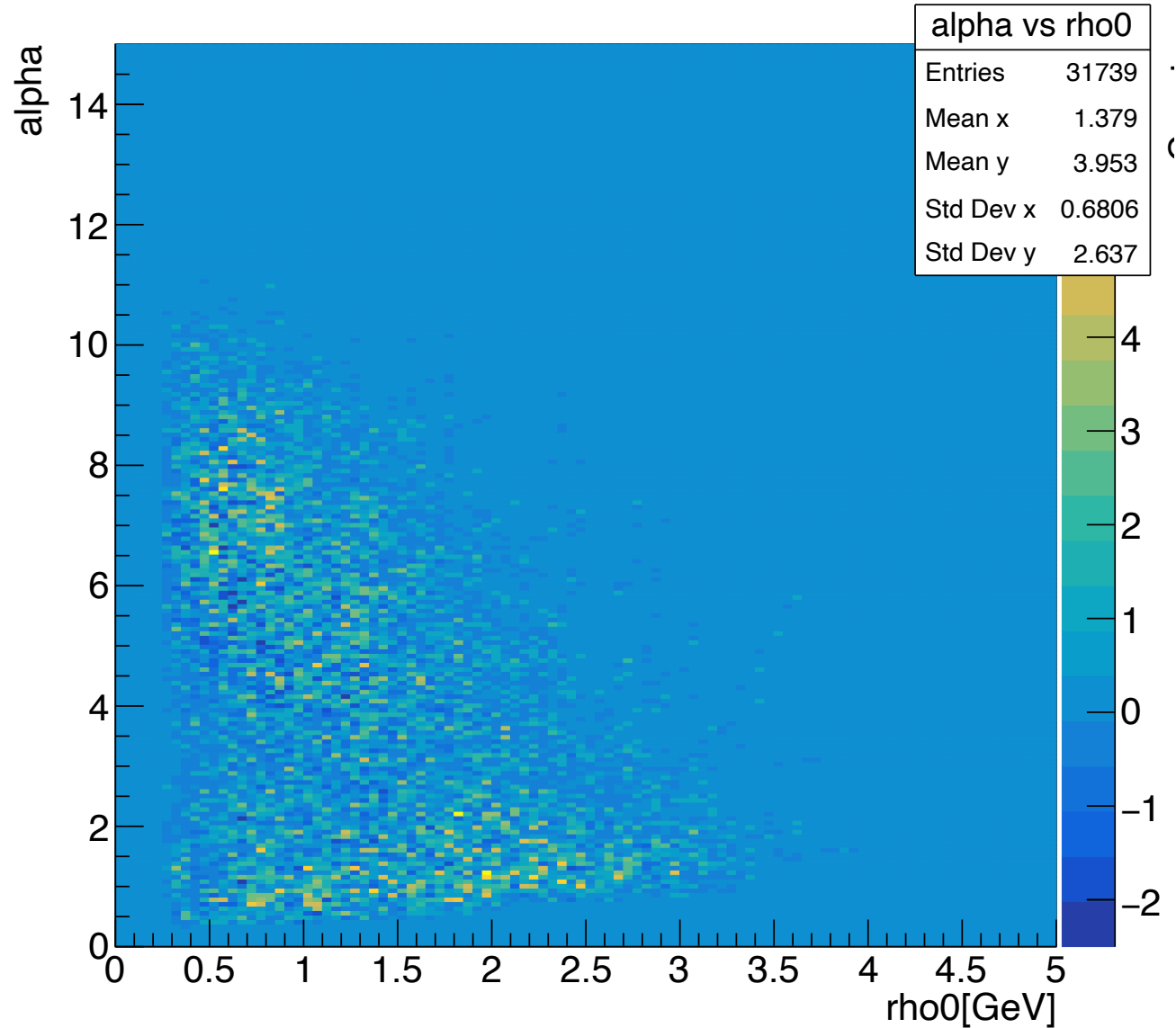


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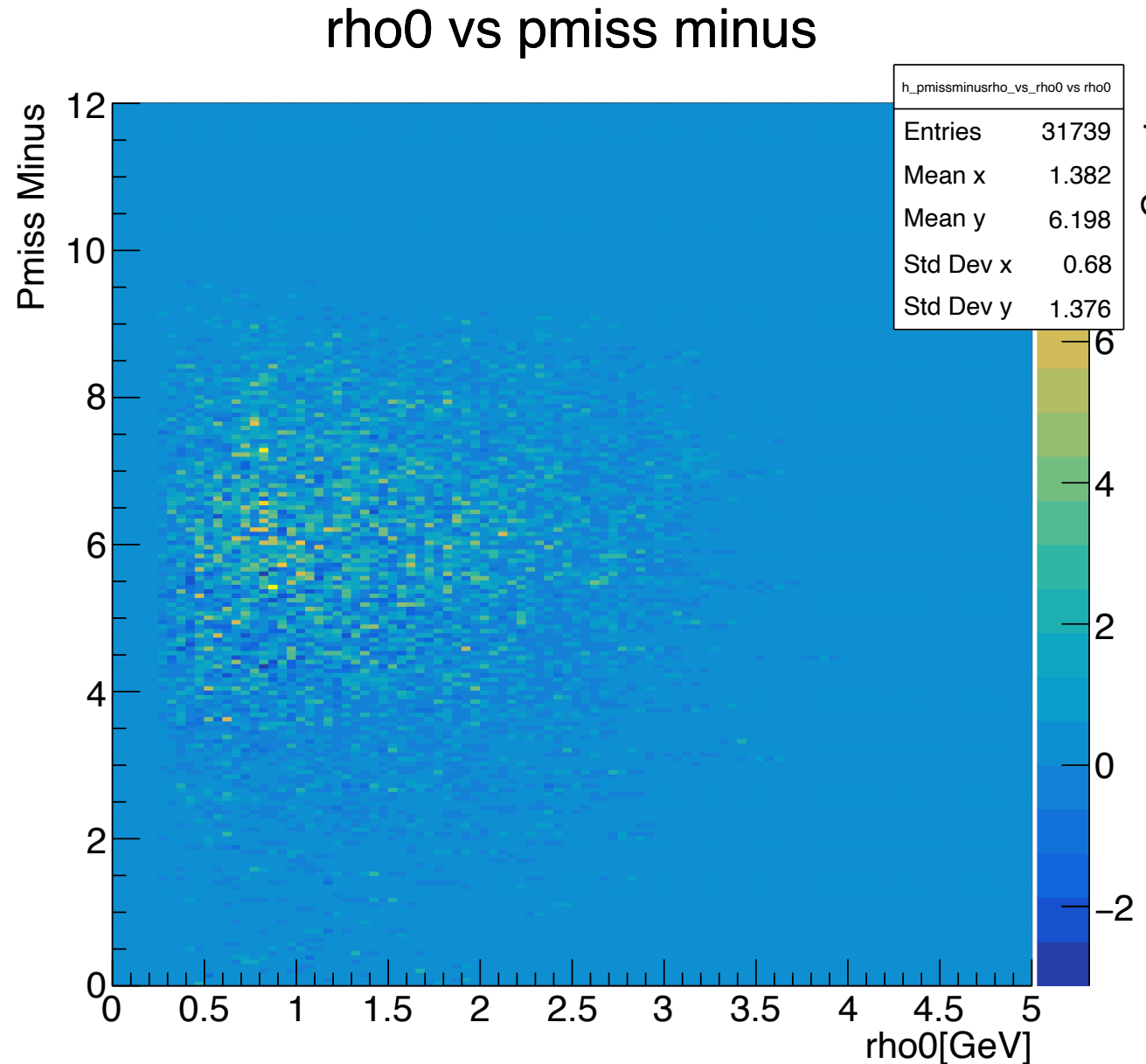
## rho0 vs alpha



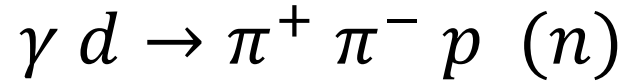
$$\gamma d \rightarrow \pi^+ \pi^- p(n)$$

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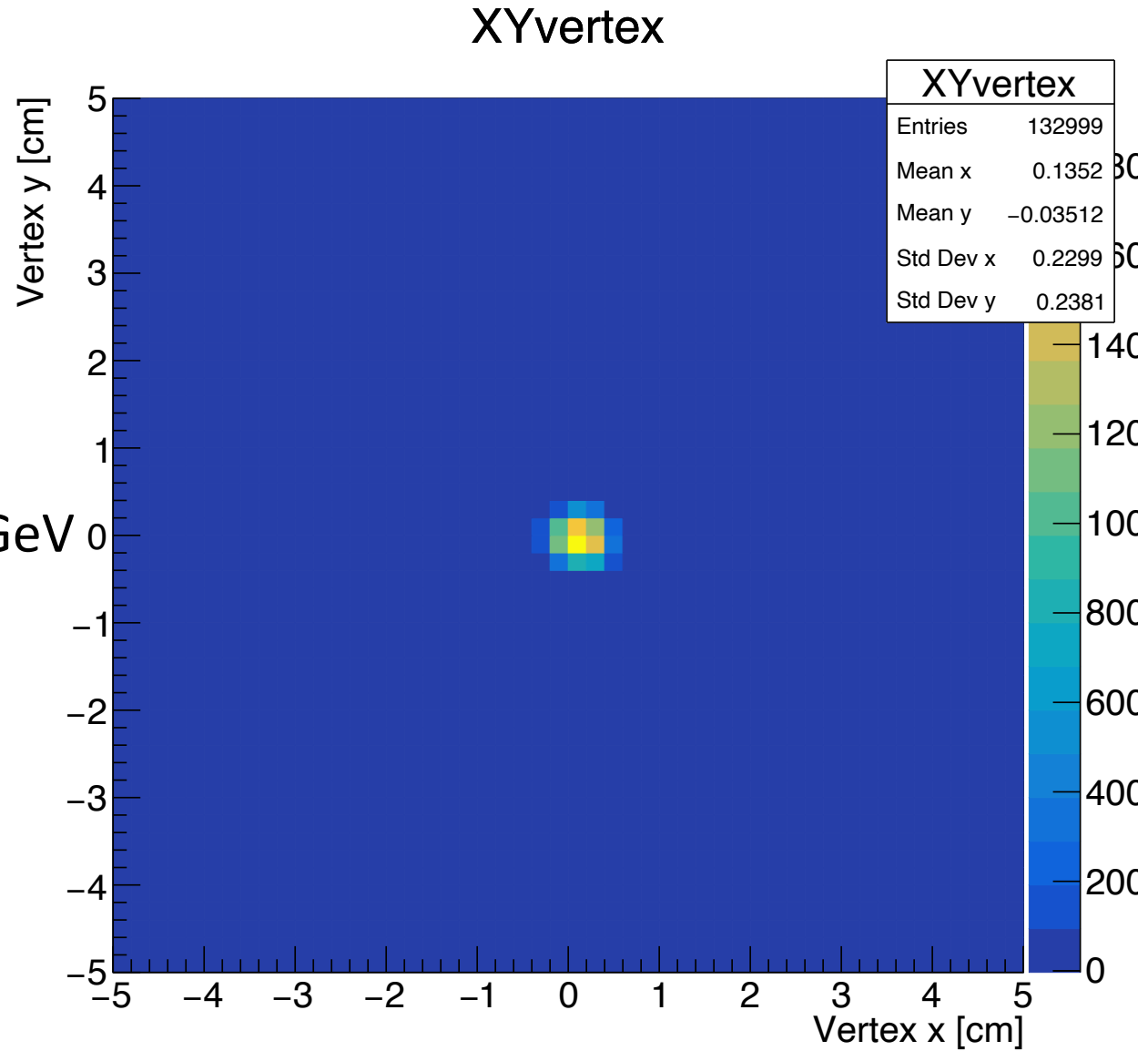


# Vertices



- Cuts Applied

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- 6 GeV < Ebeam < 10 GeV
- OffTime Subtraction

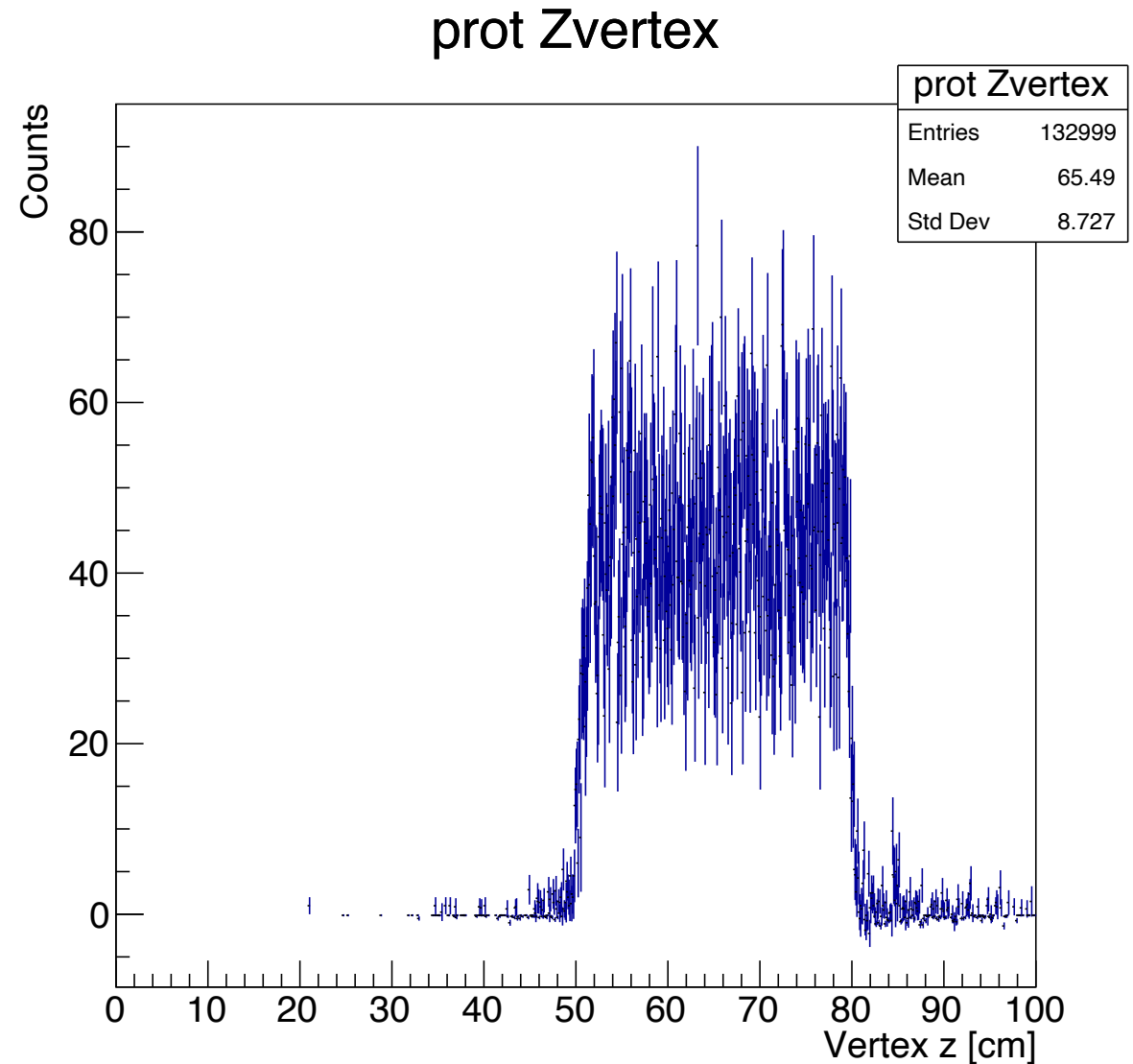




# Vertices

$$\gamma d \rightarrow \pi^+ \pi^- p(n)$$

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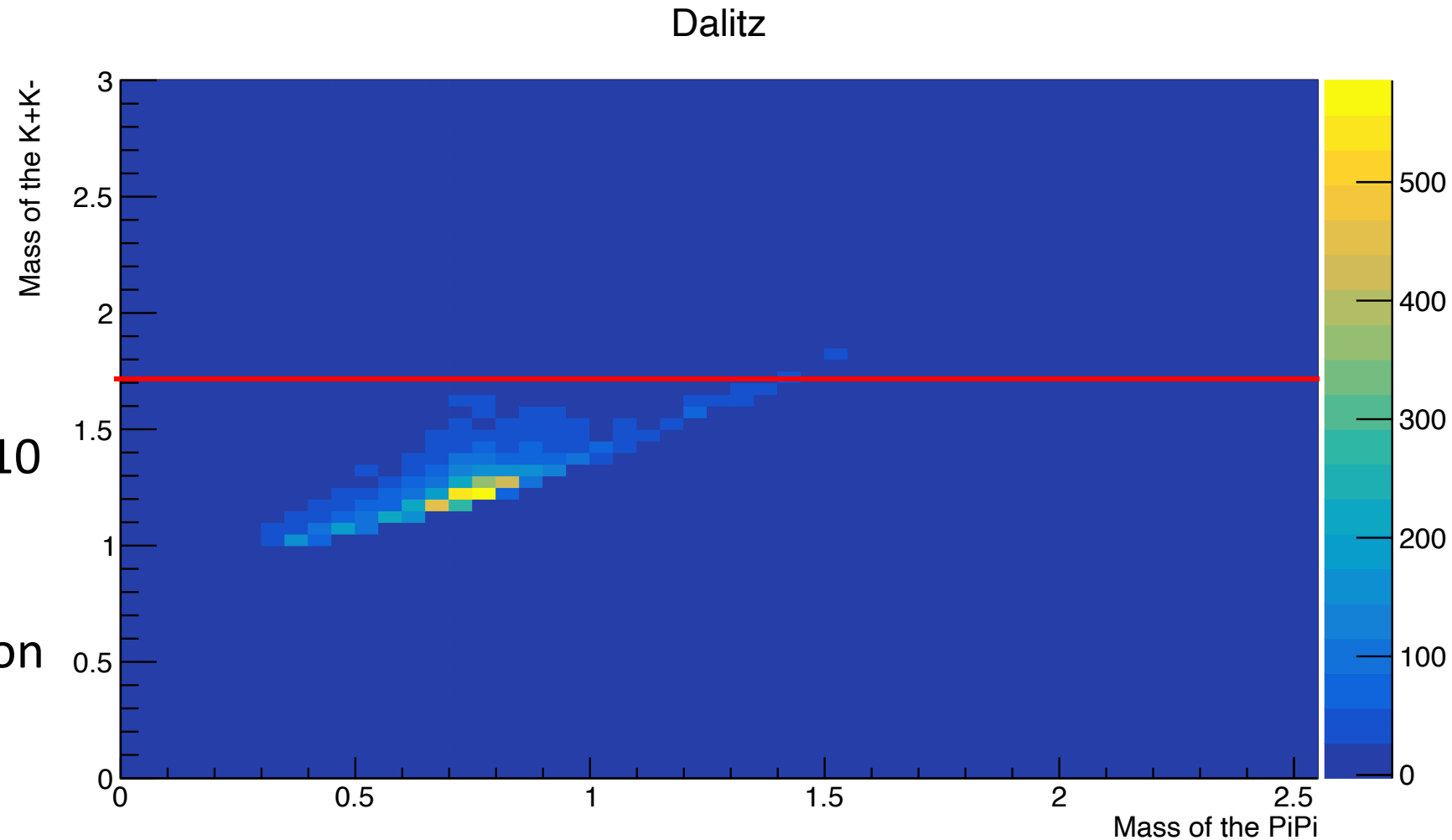


# $\phi$ vs $\rho^0$

$$\gamma d \rightarrow \pi^+ \pi^- p$$

## • Cuts Applied

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# Next steps

- Compare with simulation
- Investigate different momentum variations
  - $p_{\text{proxy}}^*$
  - $k_{\text{miss}}^*$
- Determine where rho0 events are going in the detector ( $\Theta, \phi$ )
- Run over empty cell data
- Try with other targets
- Vertex cuts