PrimEx Pi0 Update

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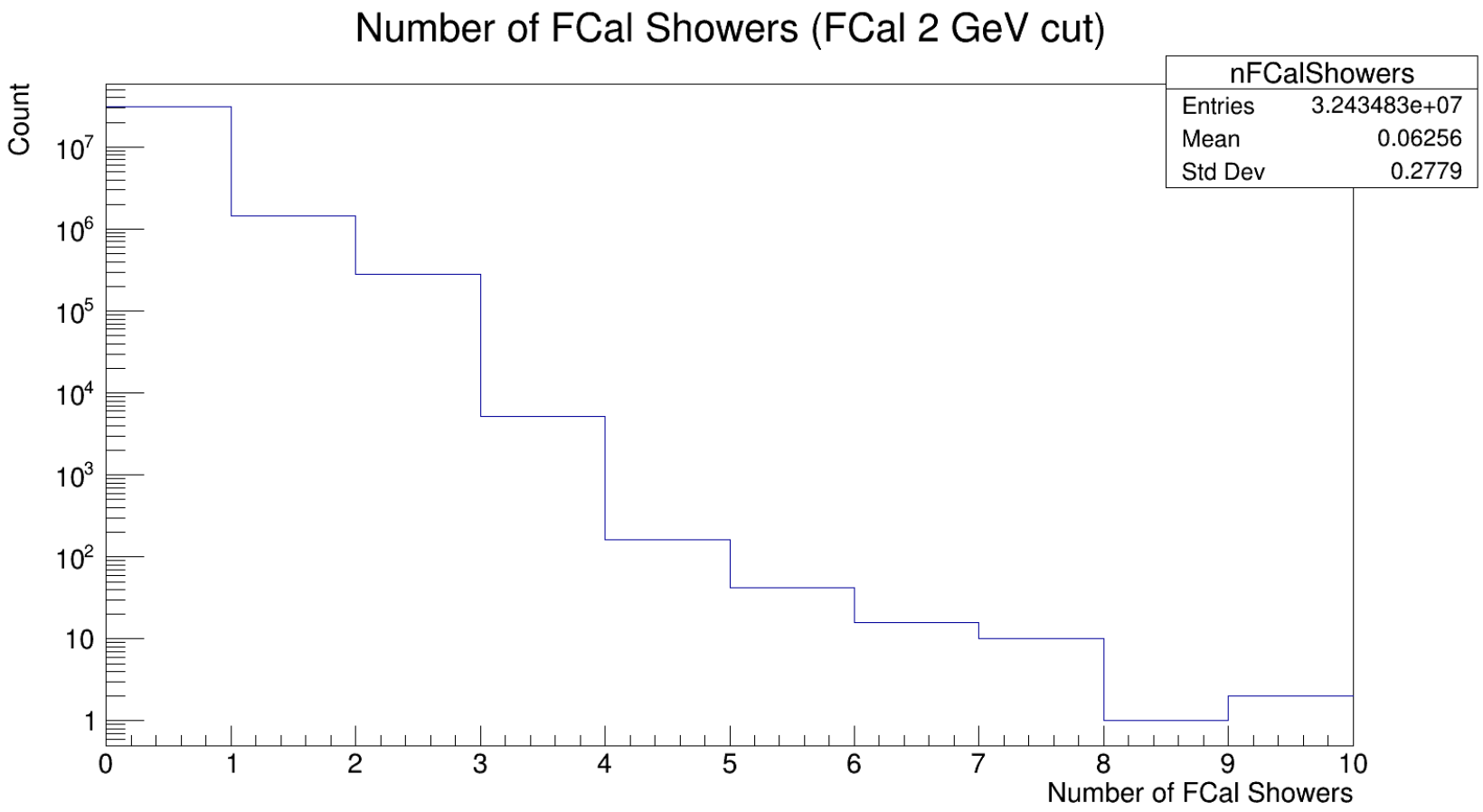
July 10

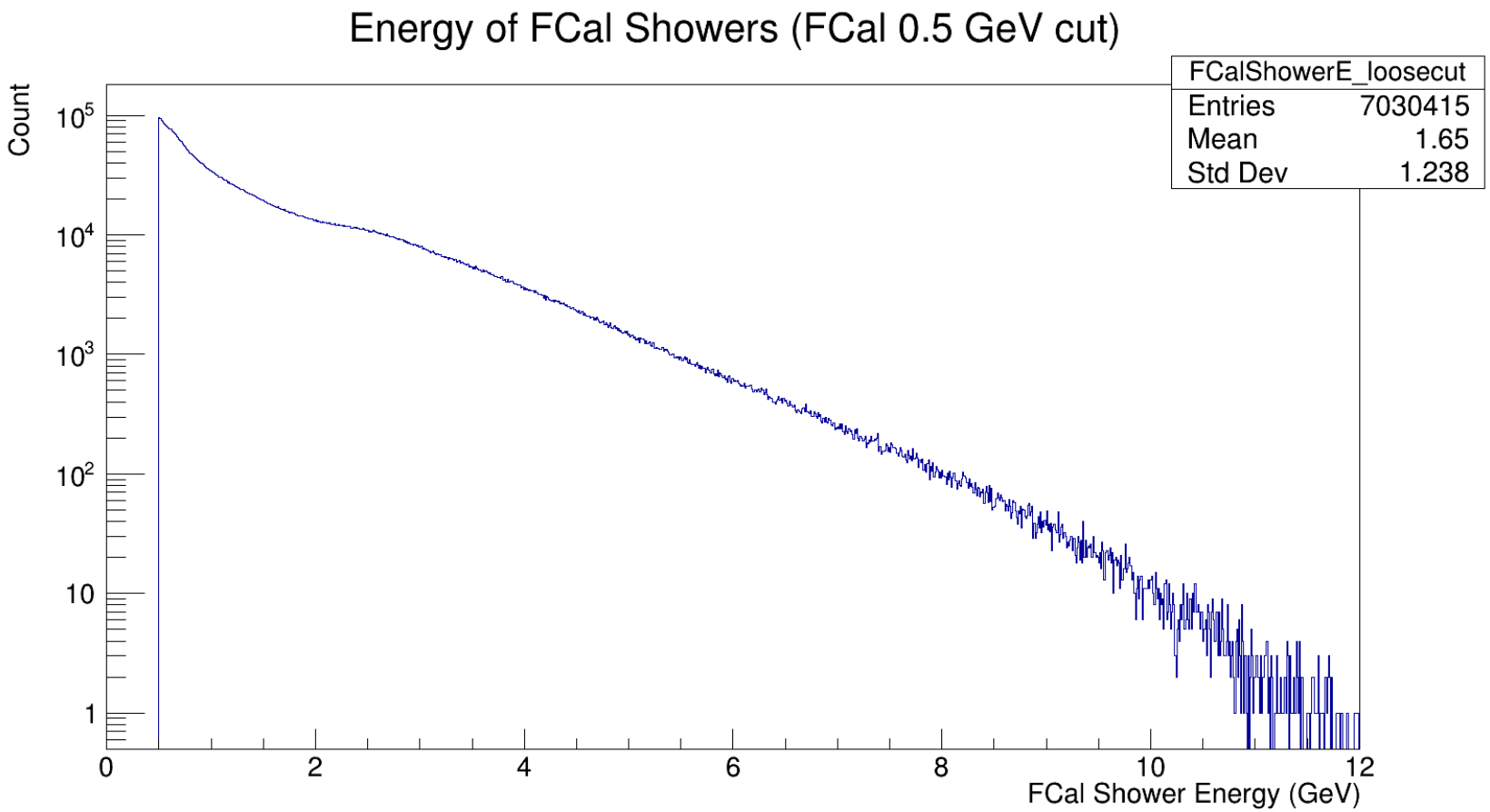
Cut Definitions

- 2 Gamma – Two showers in FCal with an energy greater than 2 GeV
- Loose Pi0 – 0.11 <= Invariant Mass (GeV) <= 0.16
- ToF Veto – No corresponding Time-of-Flight detector hit
- FCal Timing – FCal showers must occur within 4ns of each other
- Energy Conservation – Abs(Beam Energy - Meson Energy) < 1.5 GeV
- Accidental Subtraction -

Number of FCal Showers



FCal Shower Energy



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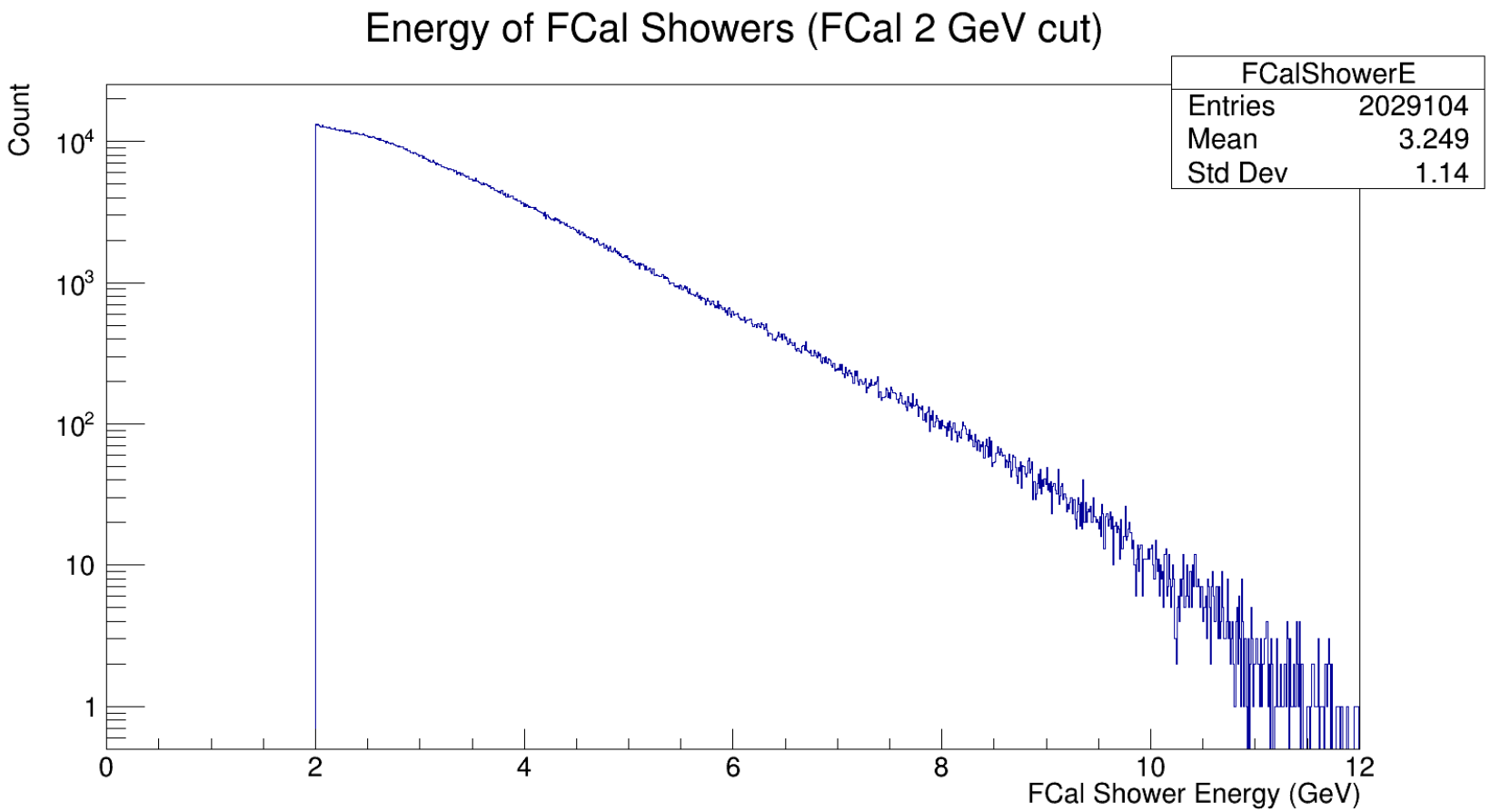
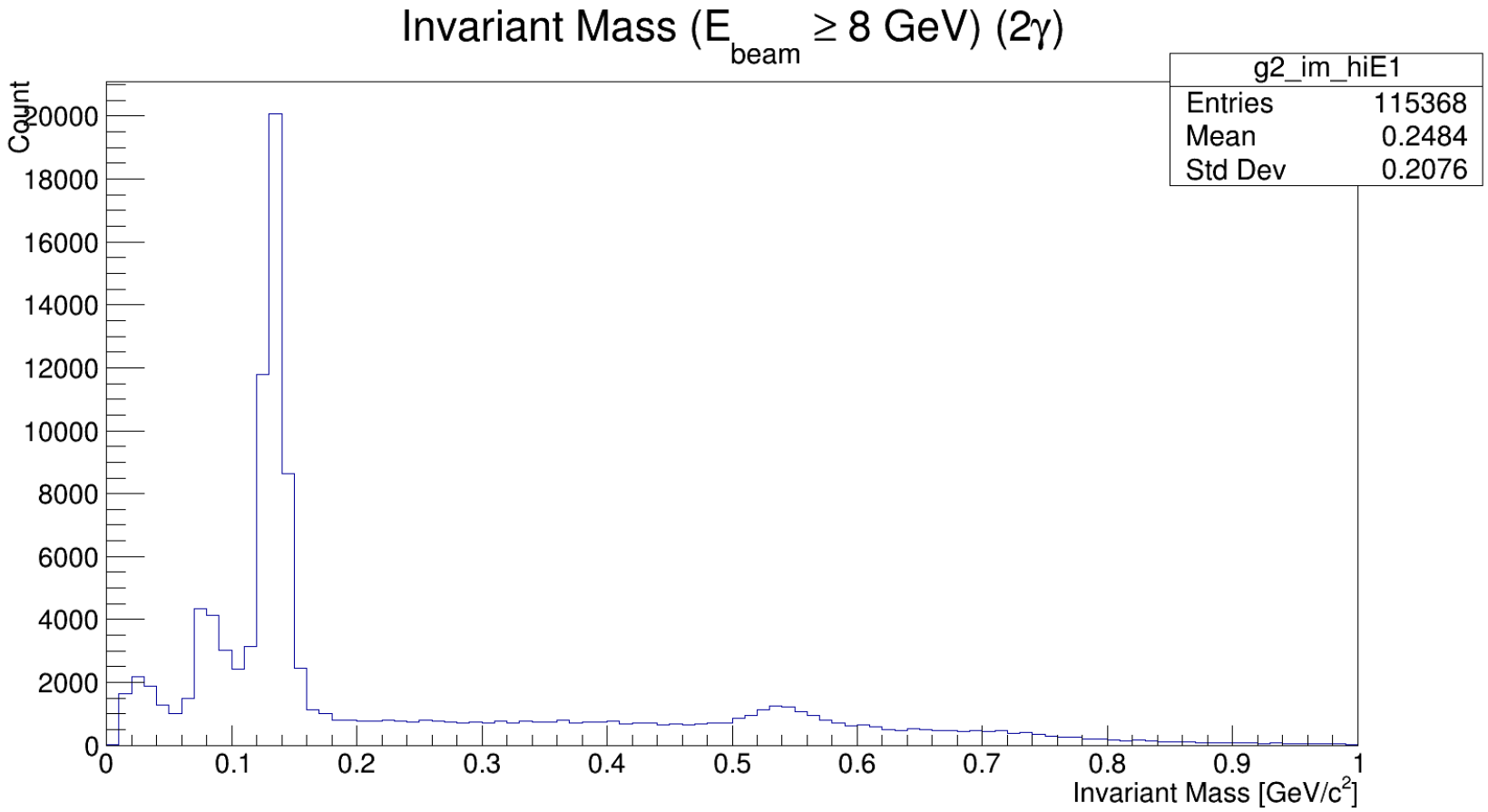
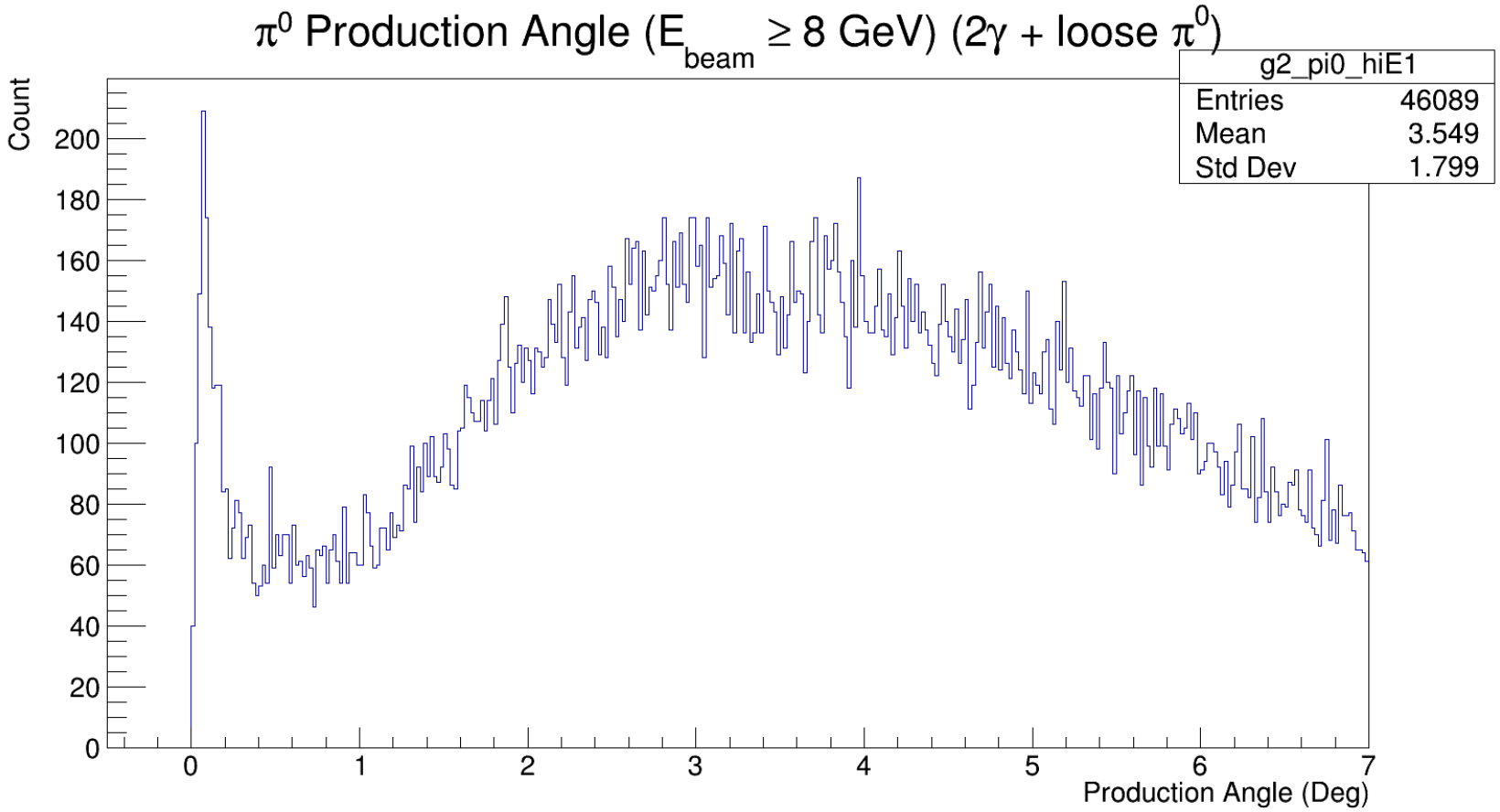


Invariant Mass



Pi0 Production Angle



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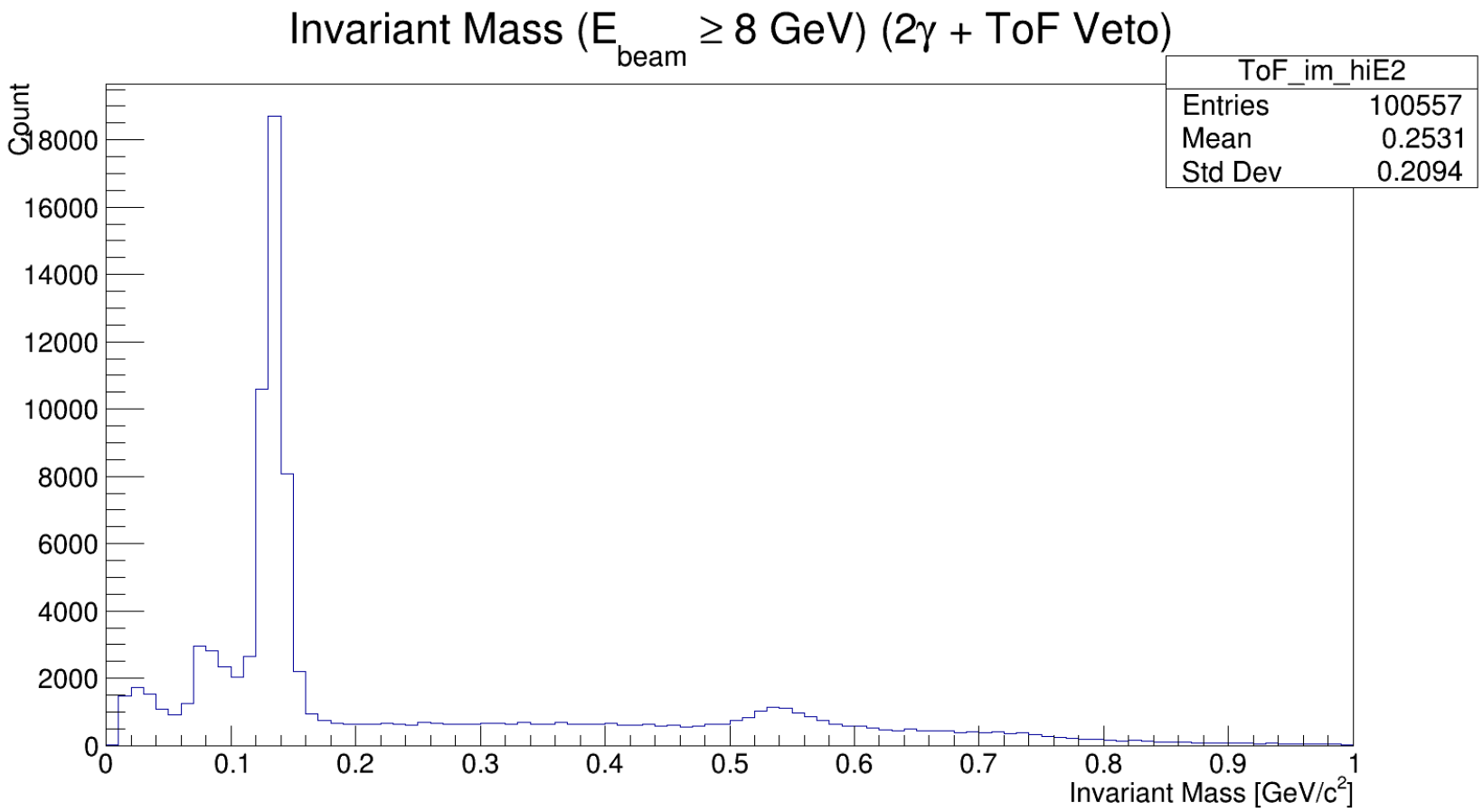

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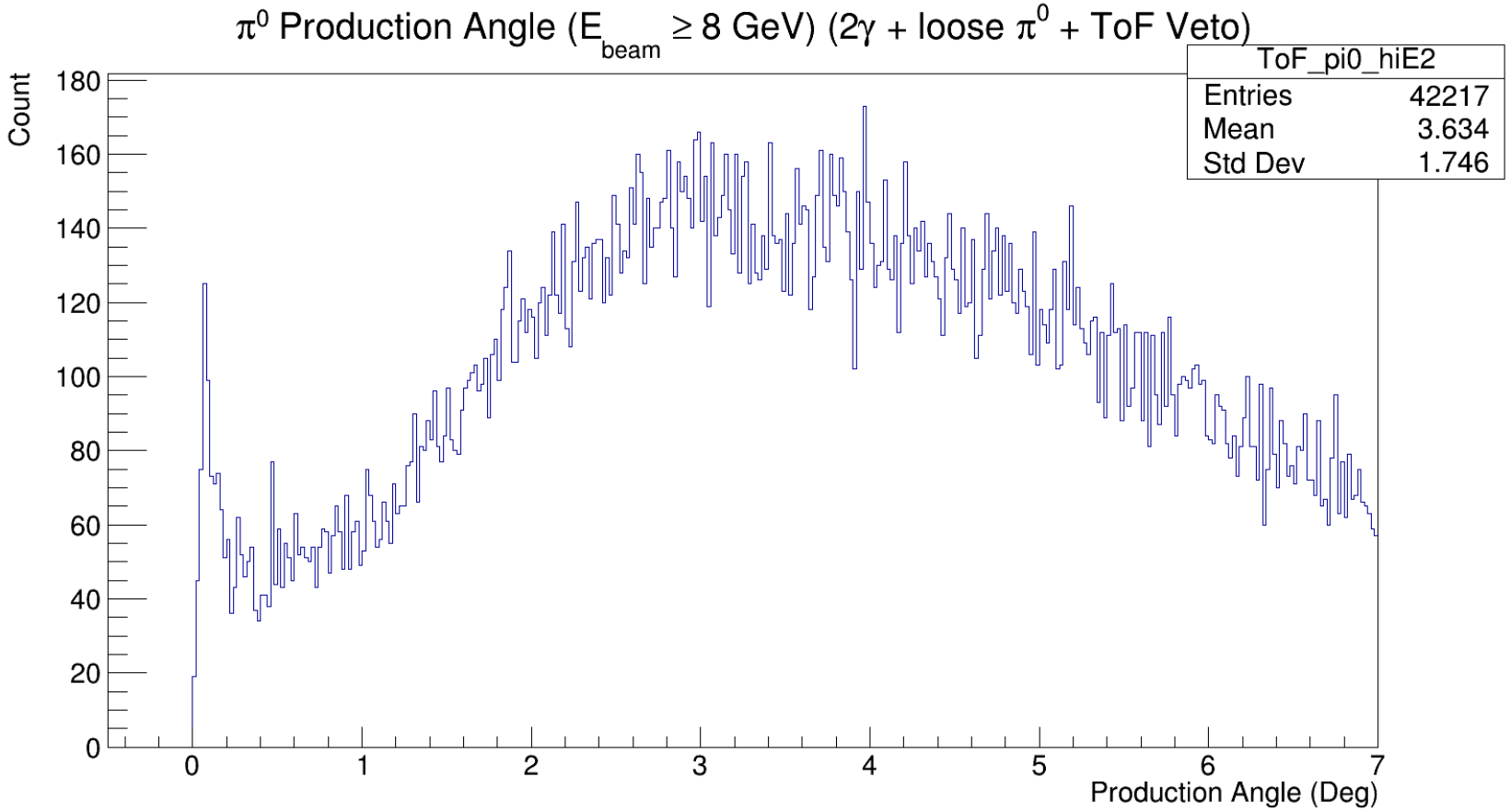
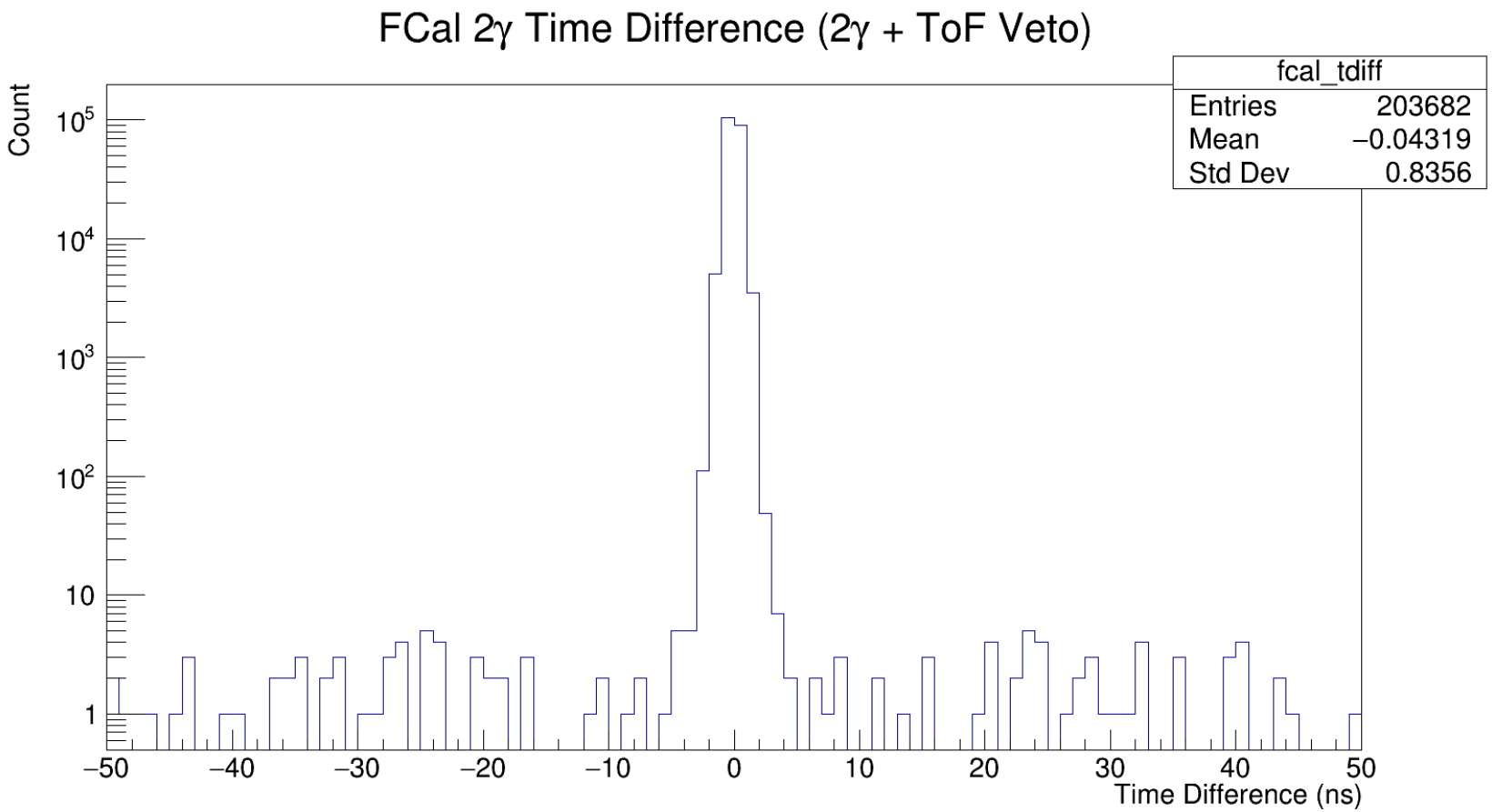


FCal Shower Timing



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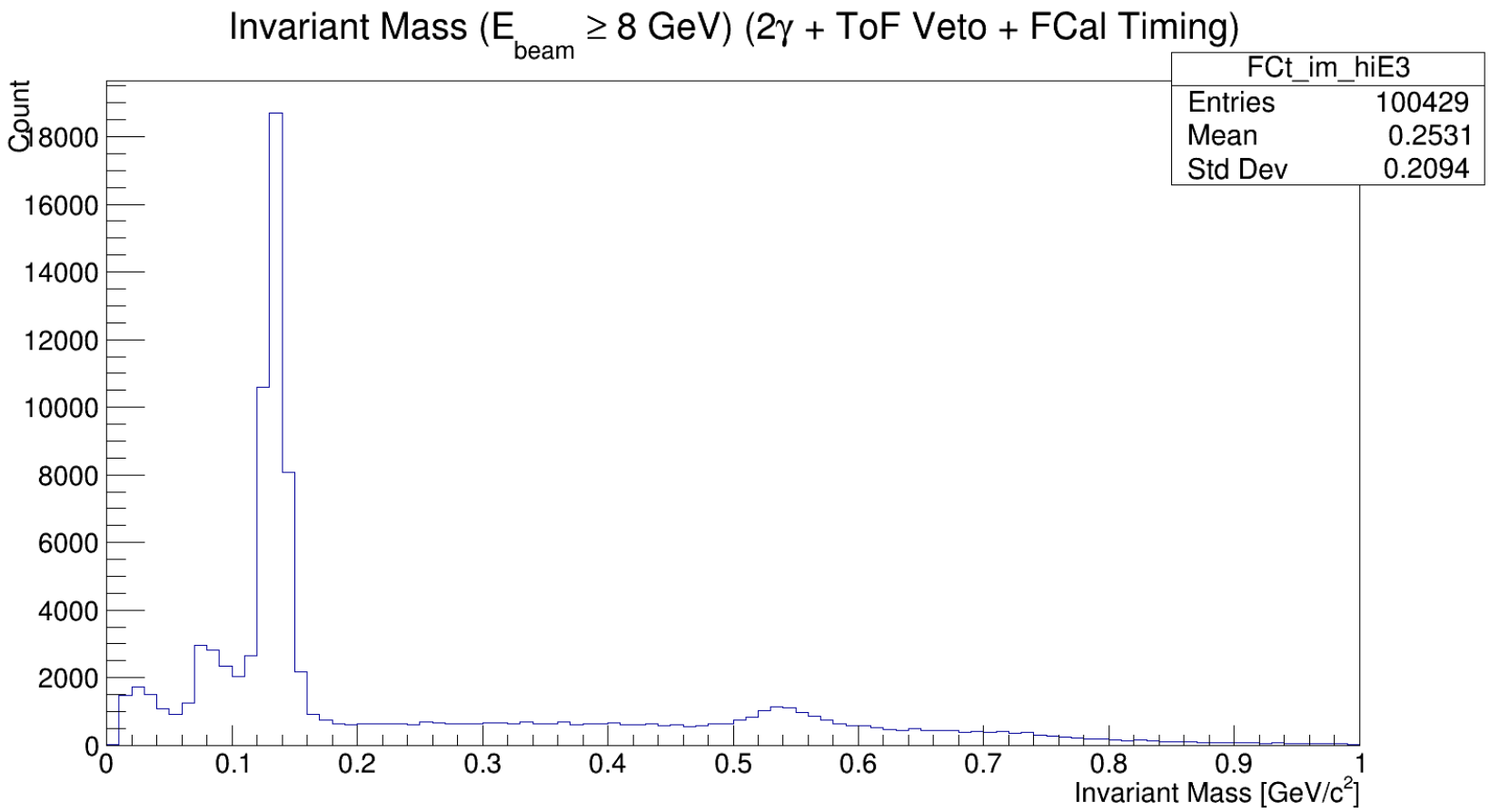

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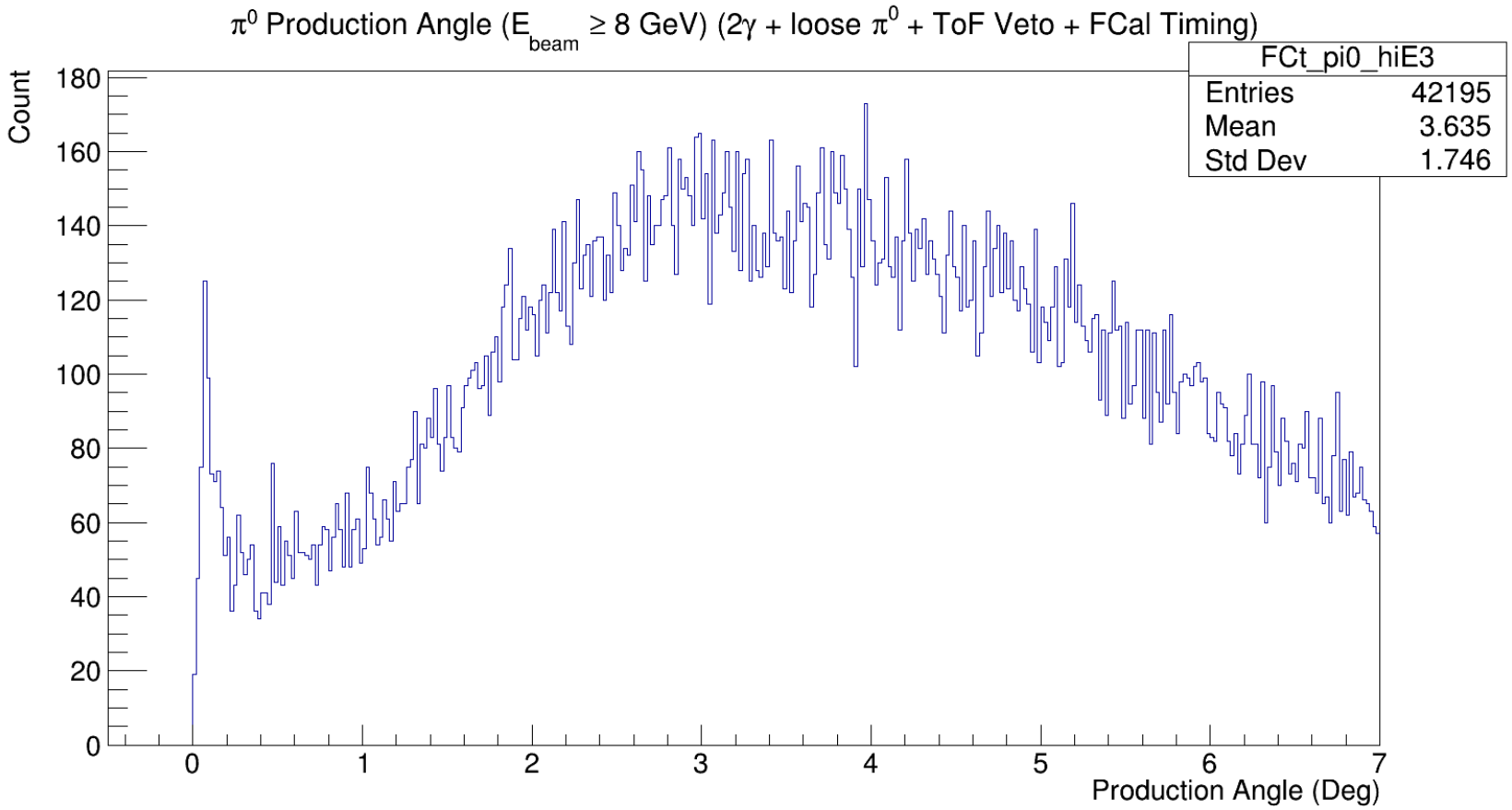
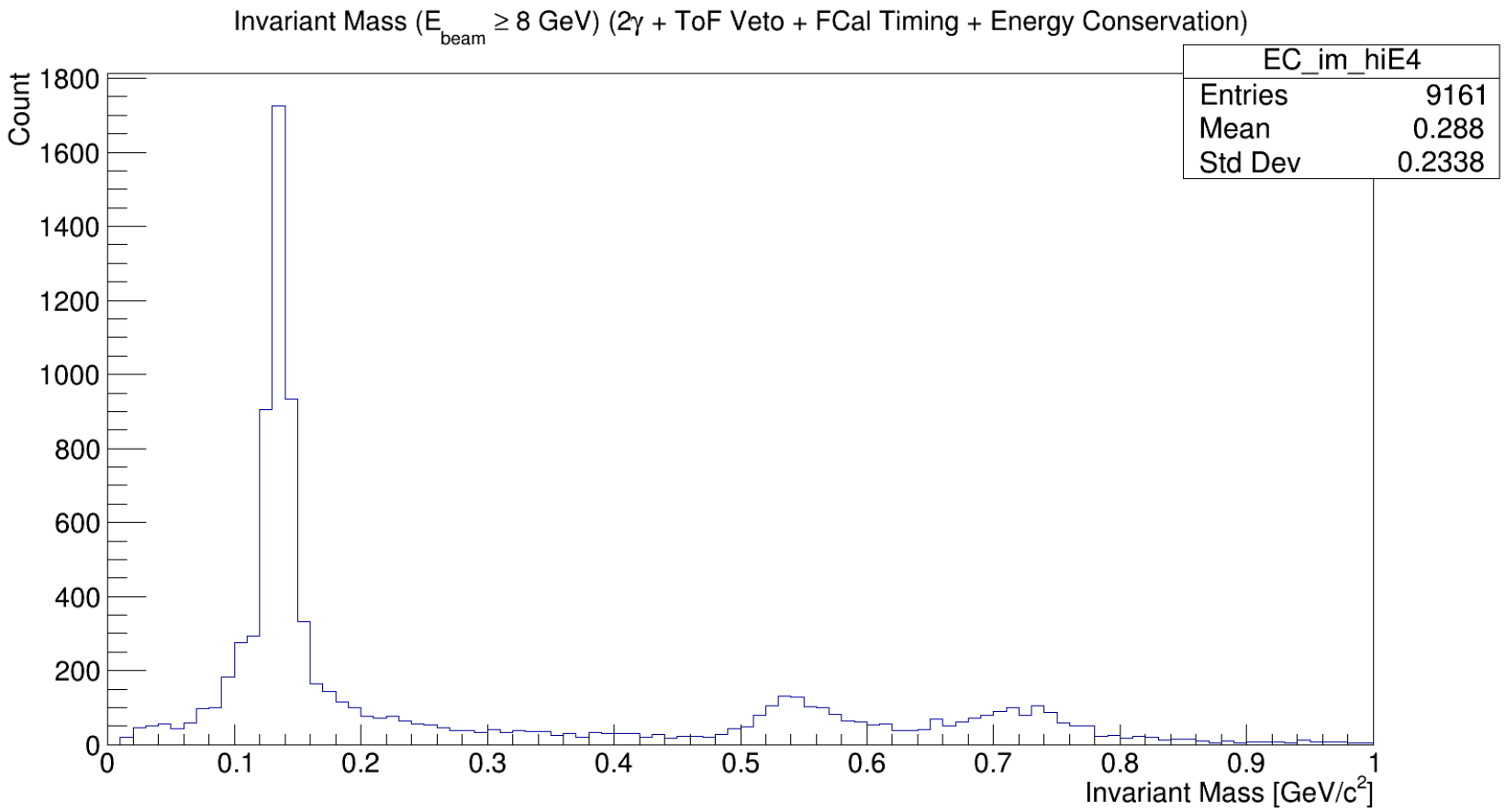


Invariant Mass



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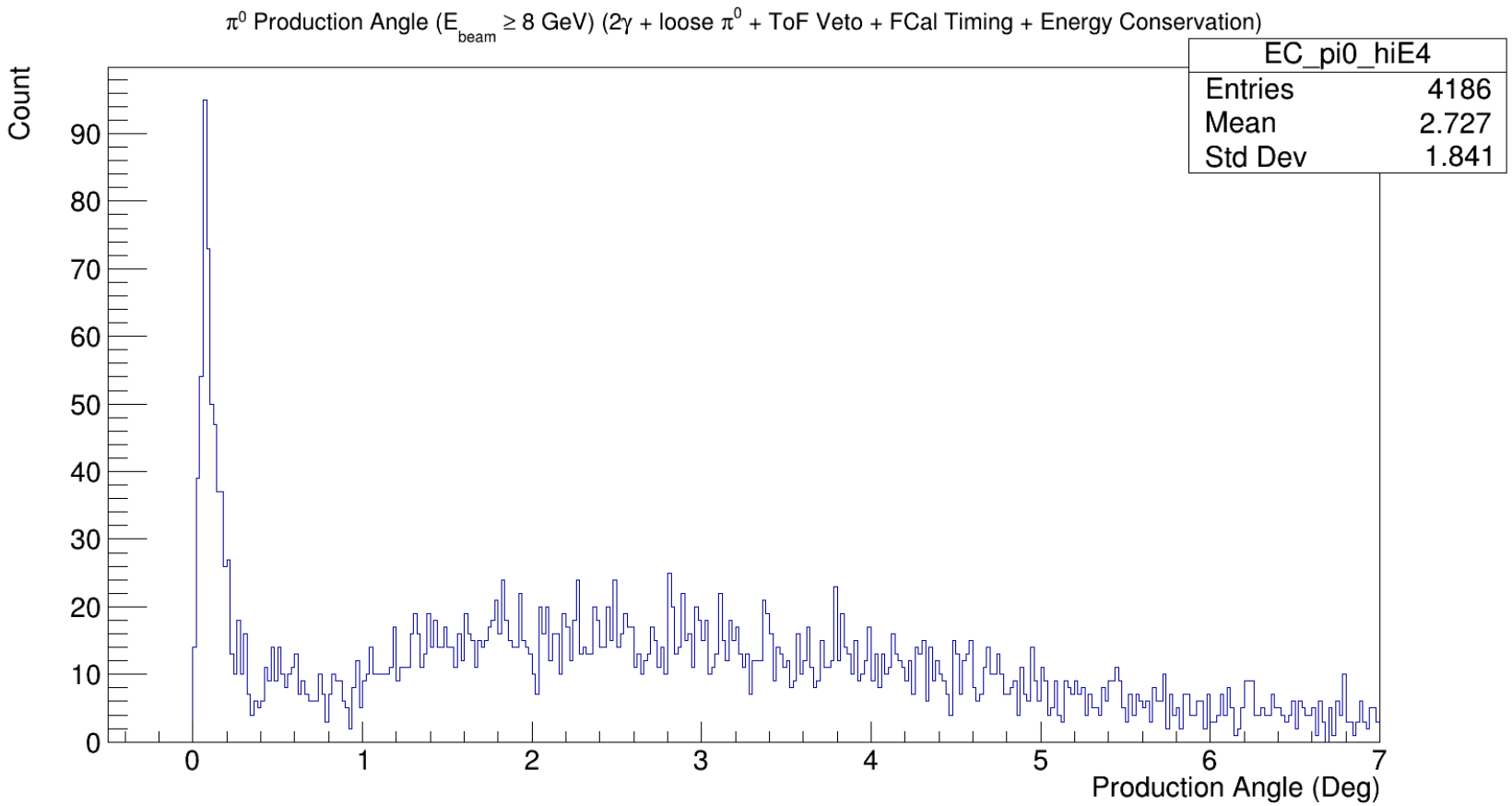
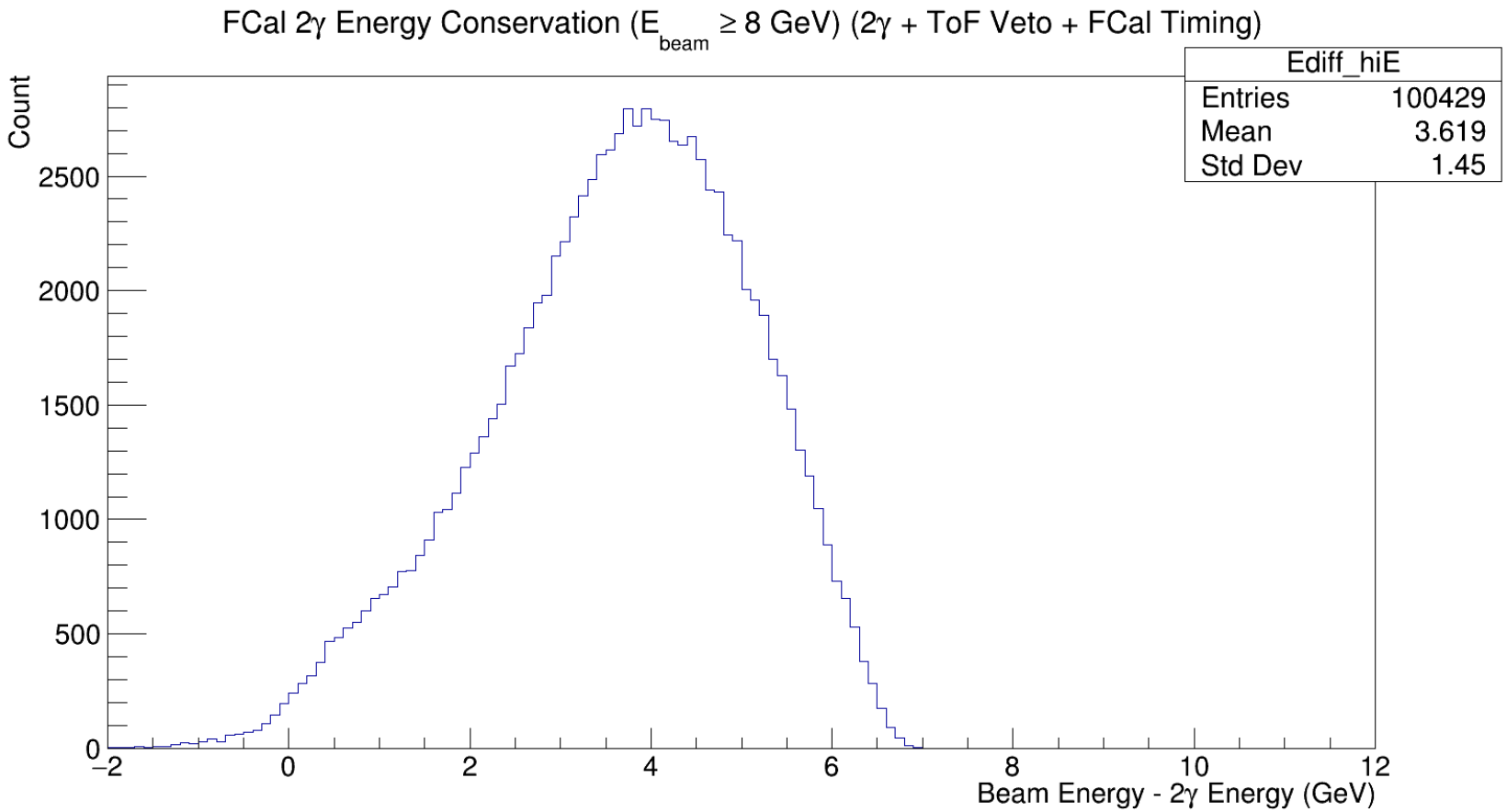
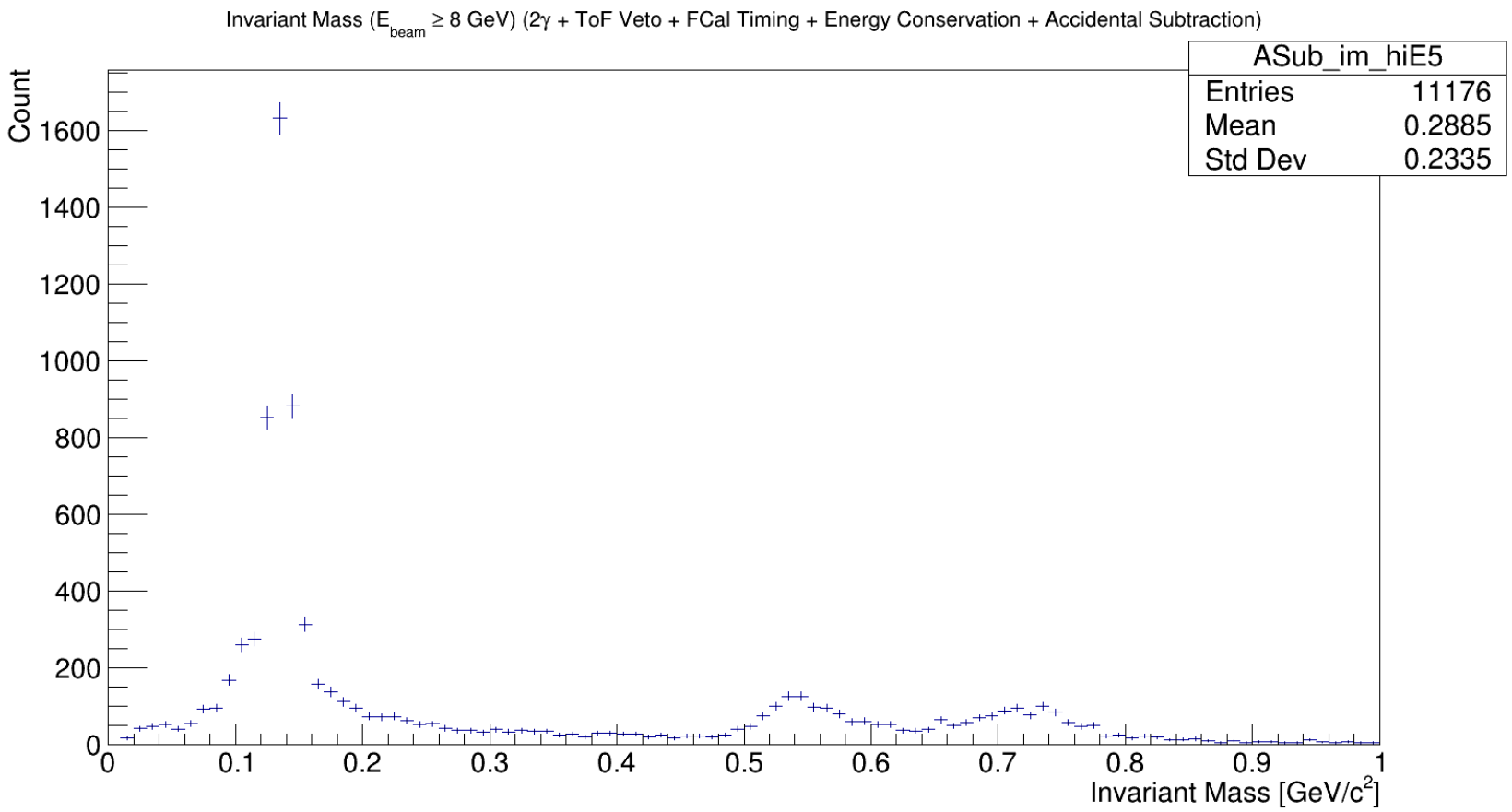


Energy Conservation



Invariant Mass



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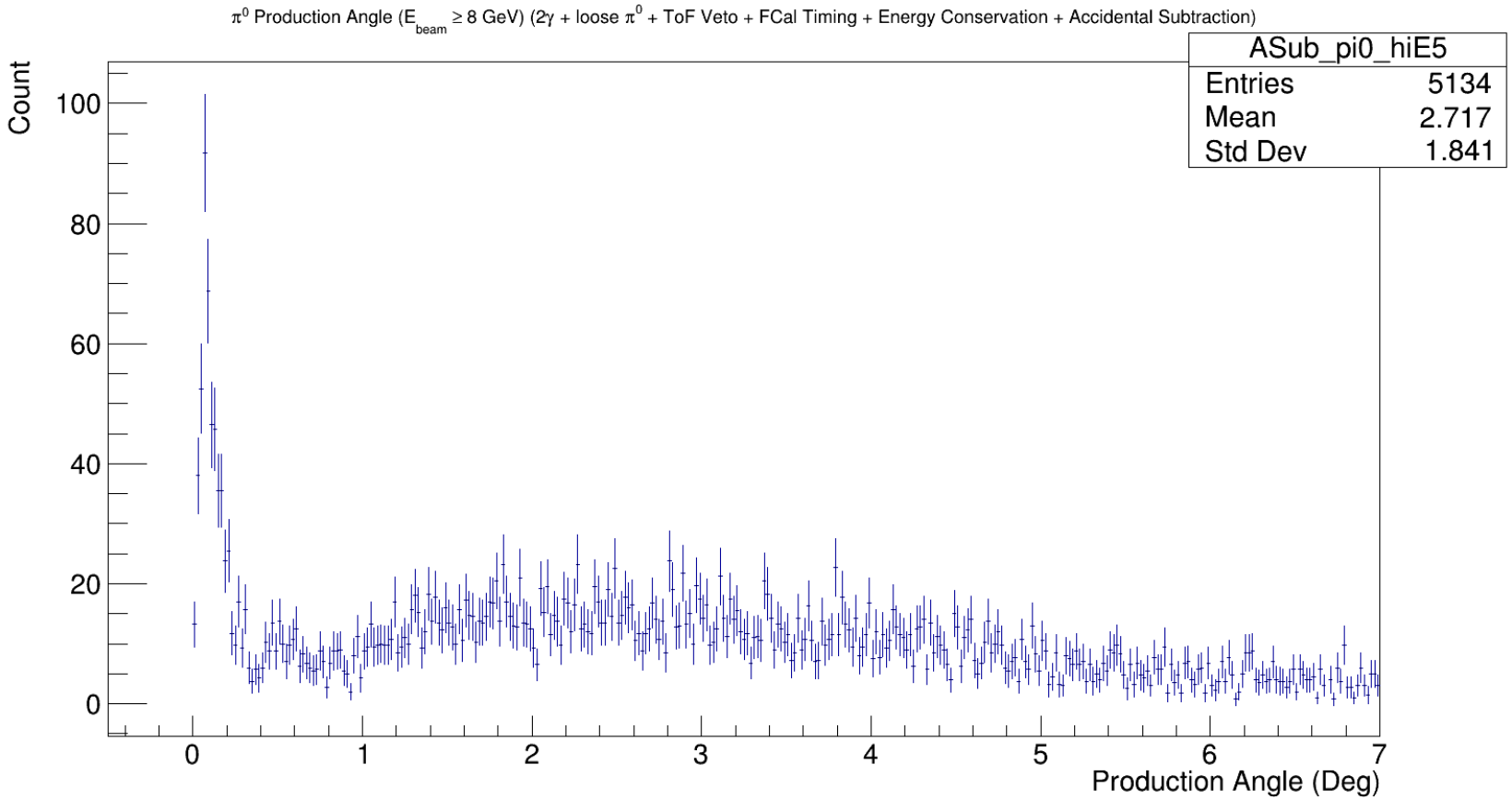
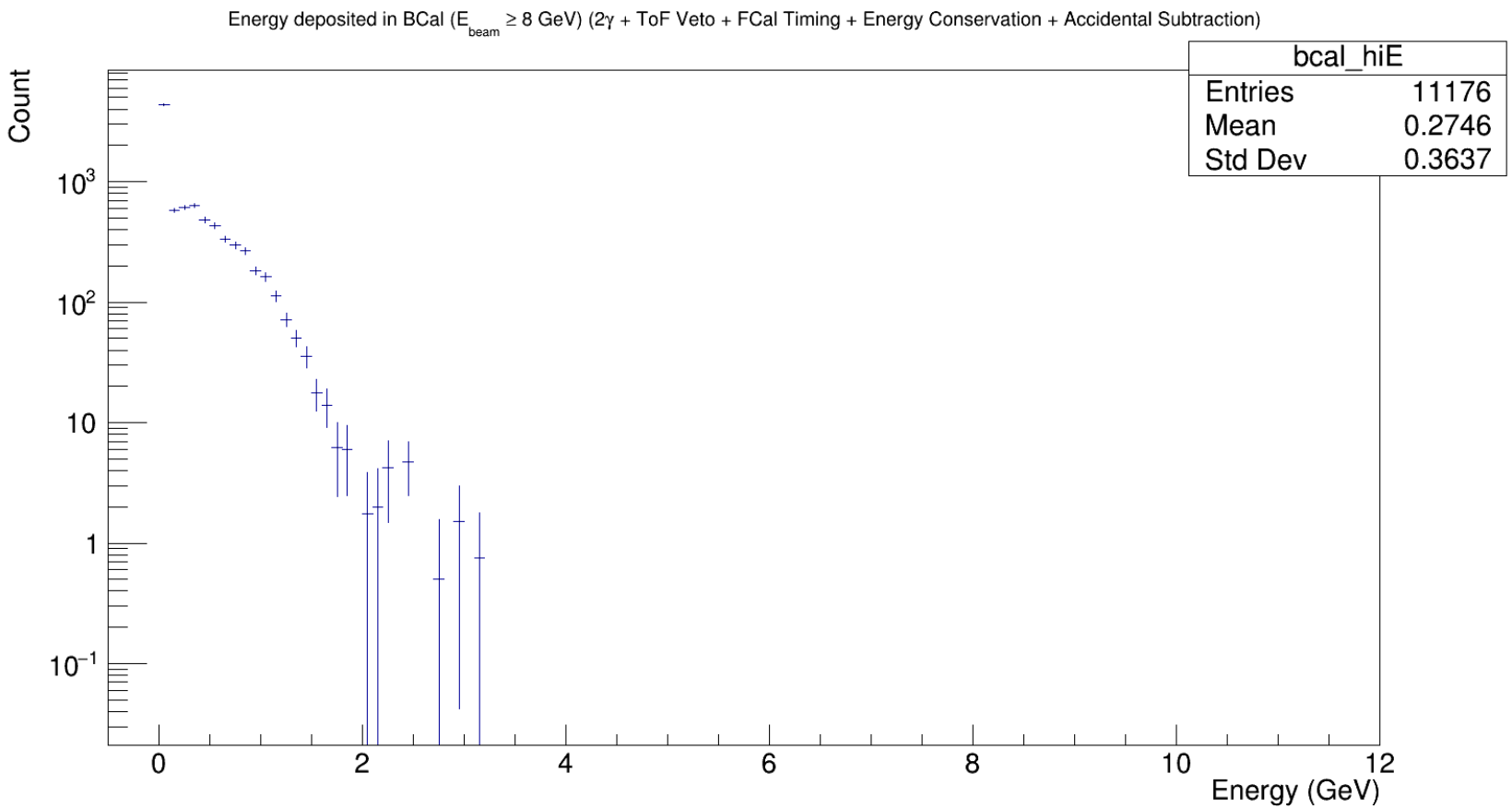


Energy Deposited in BCal



Thoughts

- Pi0 Primakoff peak is clearly visible
- Coherent peak disappears with Energy Conservation cut
  - Last week mistakenly attributed this to BCal cut
    - No BCal cut in these plots
  - Is energy conservation cut too tight?
  - Energy conservation cleans up invariant mass peak from inner/outer ring of FCal.
    - Cutting on that first may illuminate a better Energy Conservation cut
- Currently investigating if signal in BCal contains coherent peak
  - VERY loose cut on BCal shower energy (0.1 GeV) just to see if there is any contribution
  - Two photons that make up Pi0 can be in FCal or BCal
  - Code is currently running. Code test on VERY small amount of data suggests there will not be a significant contribution