Insert Jet Studies Update

Sean Preins

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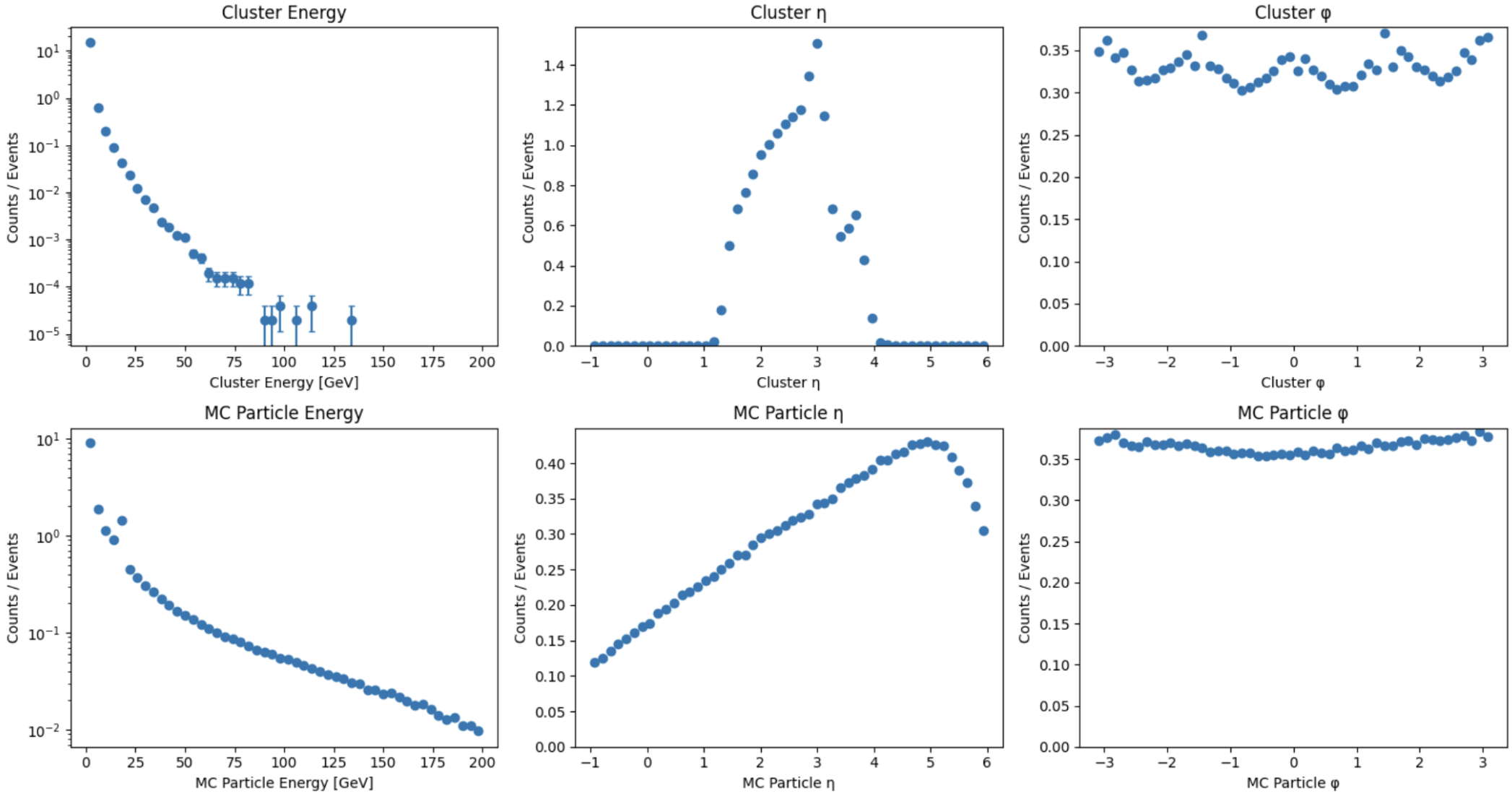
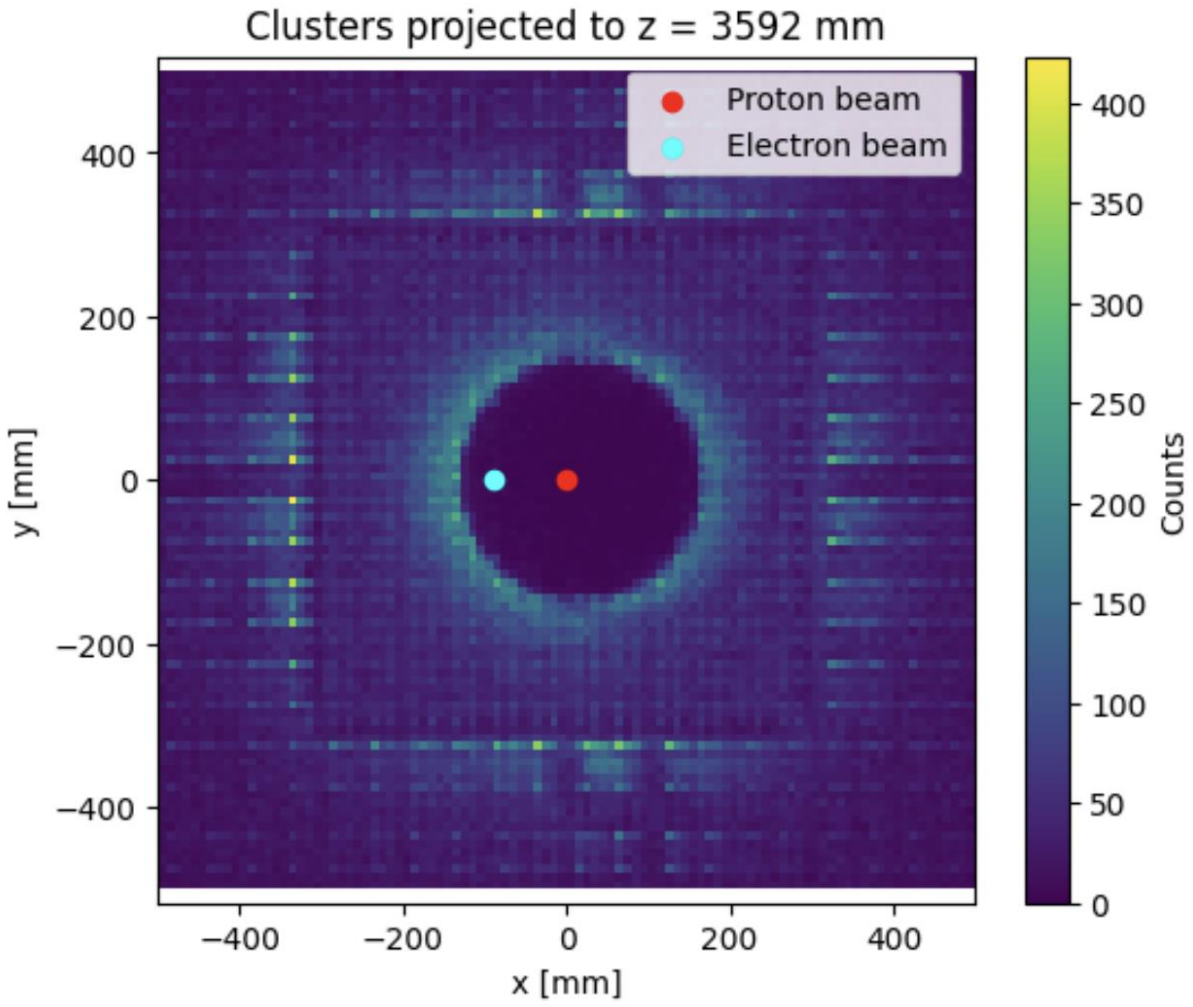
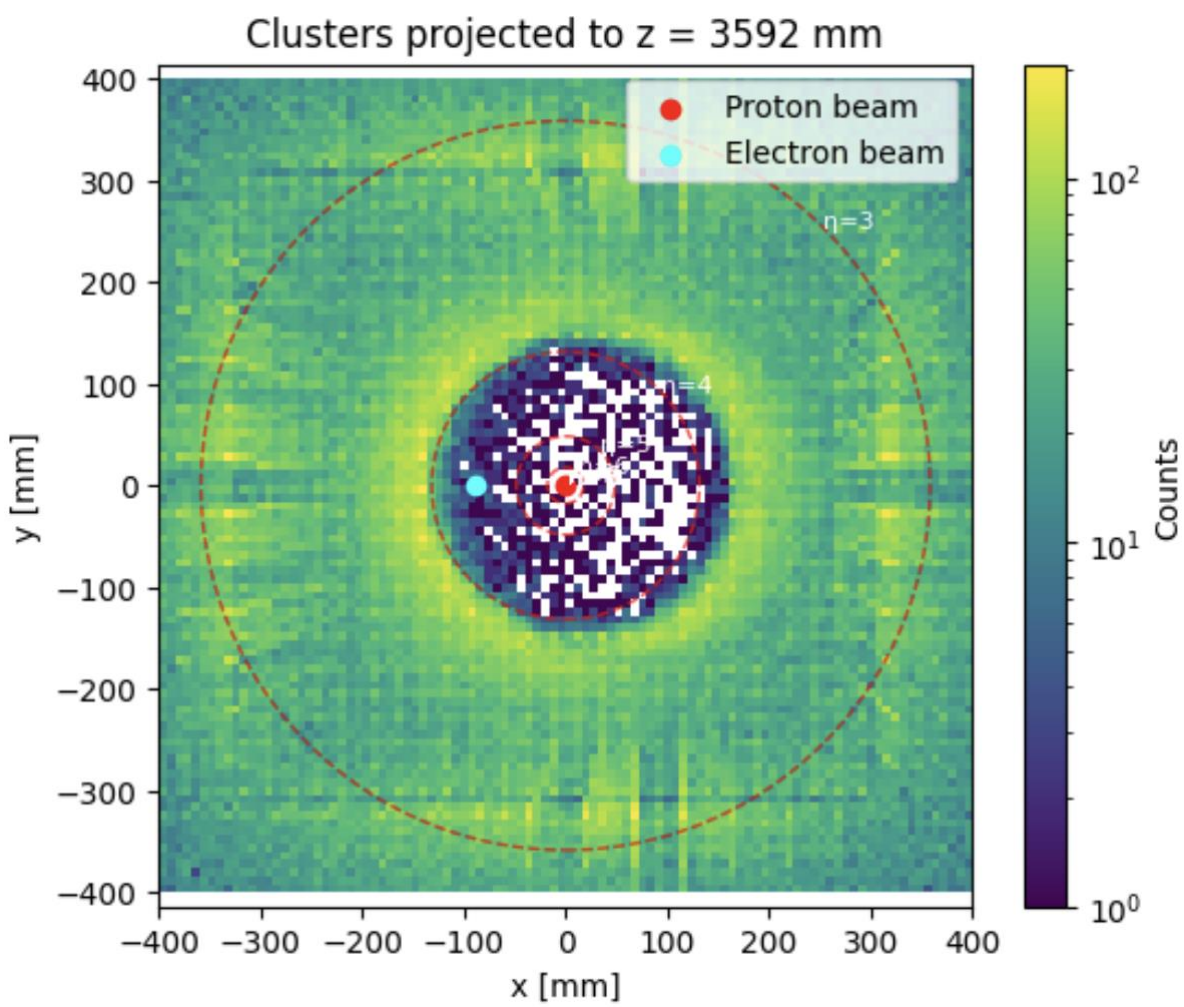
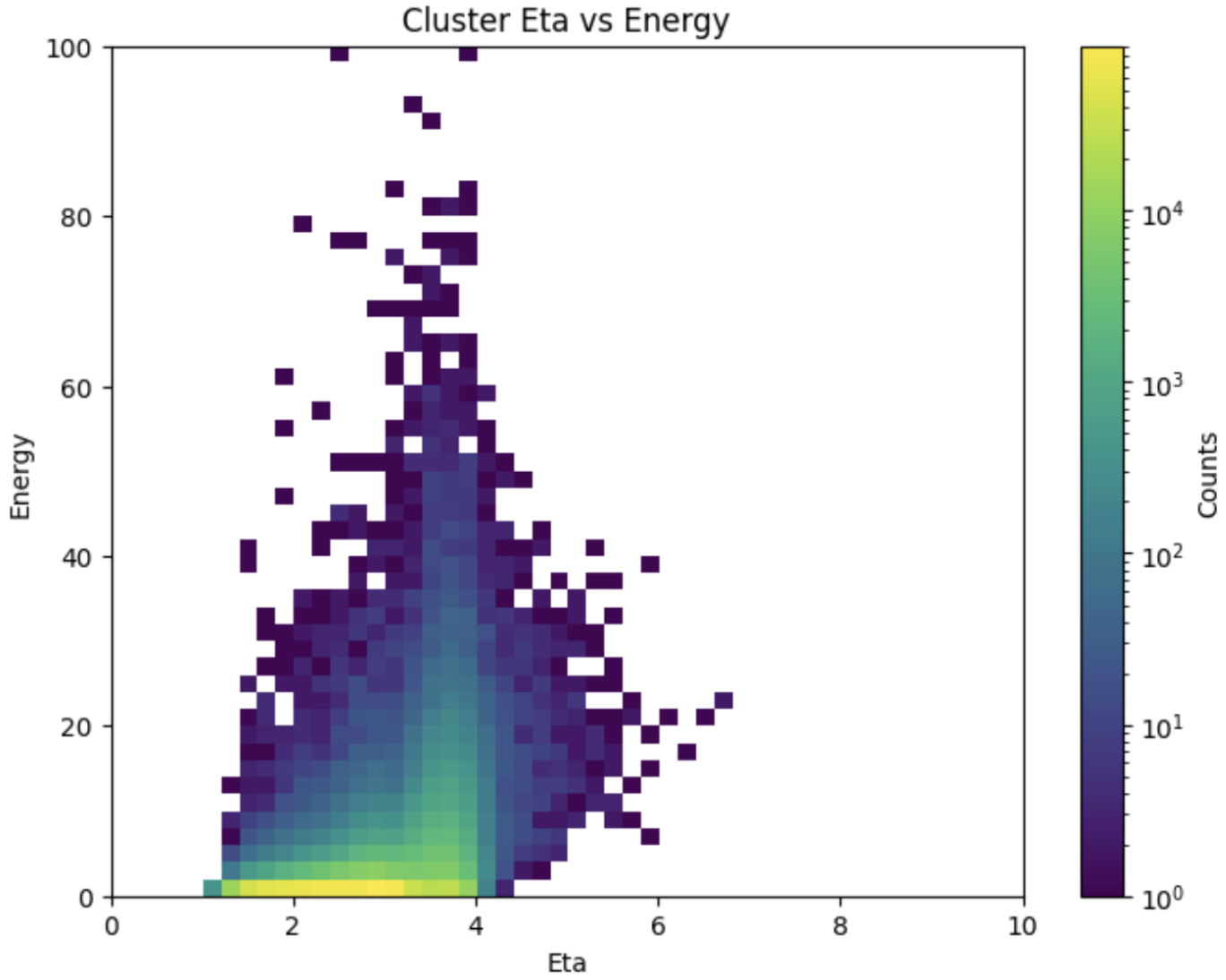


- Cluster distributions from the LFHCAL, ECal endcap, and ECal + HCal insert, and MC particle distributions



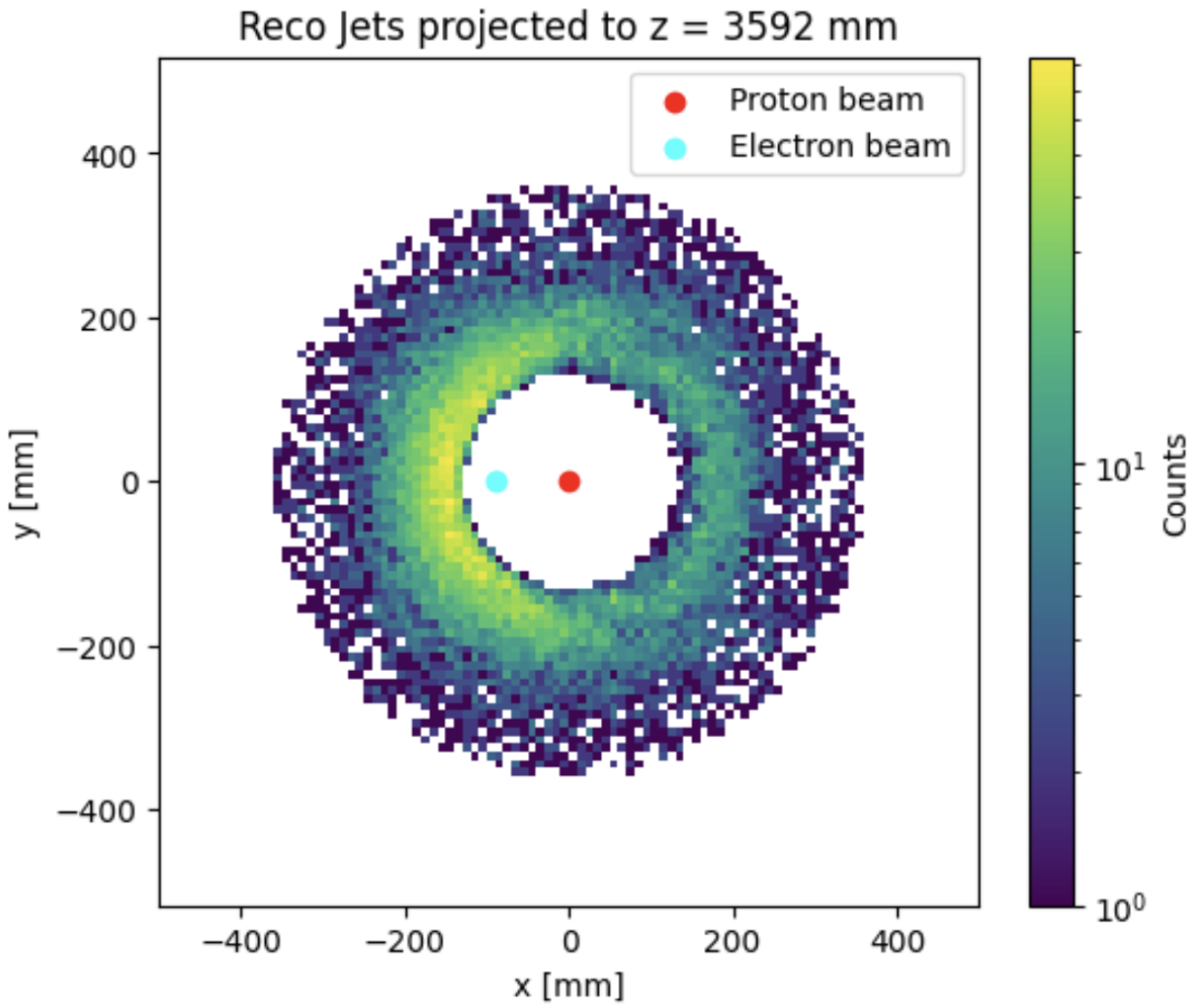


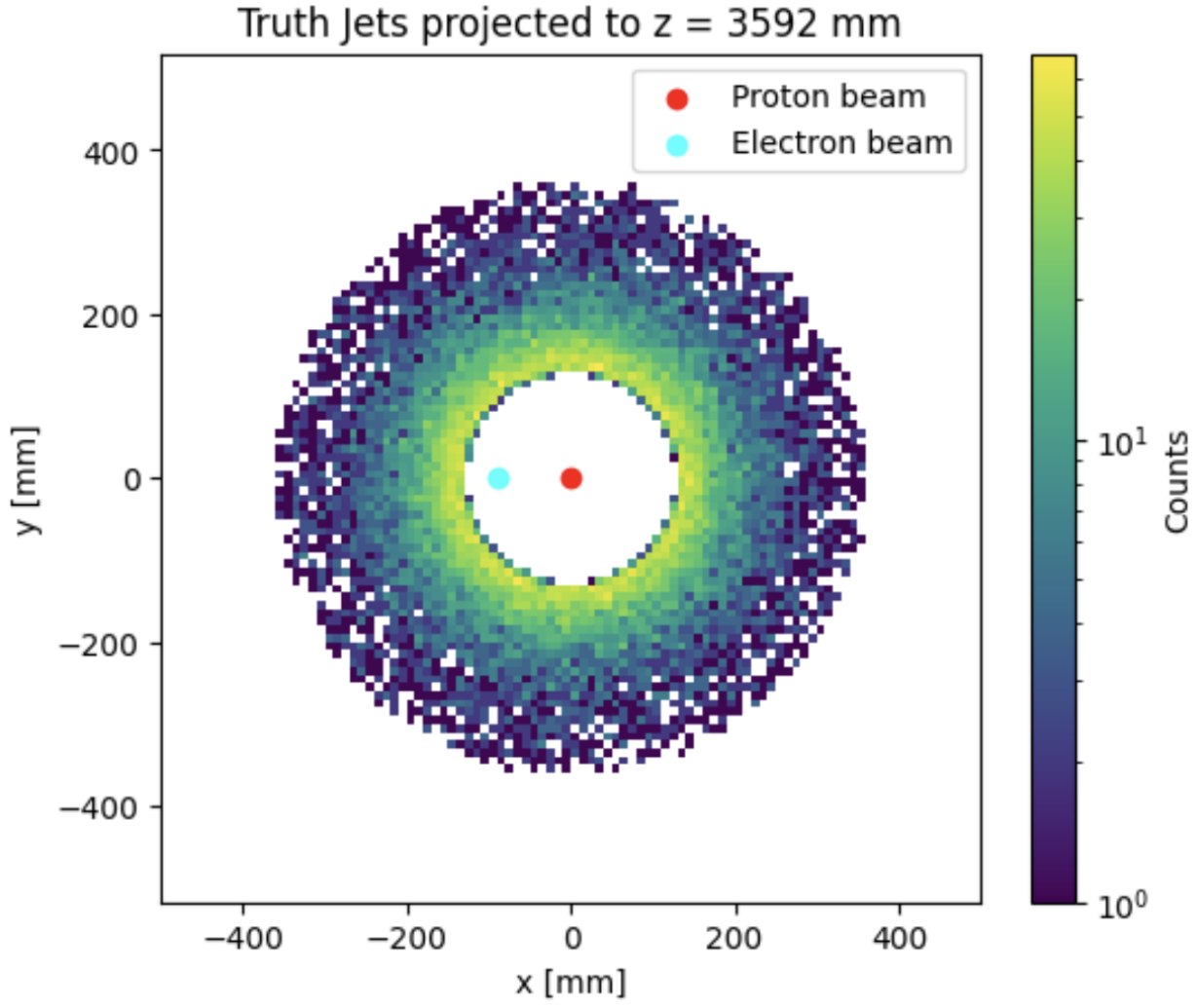
- Clusters are sometimes getting reconstructed within the beampipe region, explaining why jets were also getting reconstructed beyond the boundary of the insert

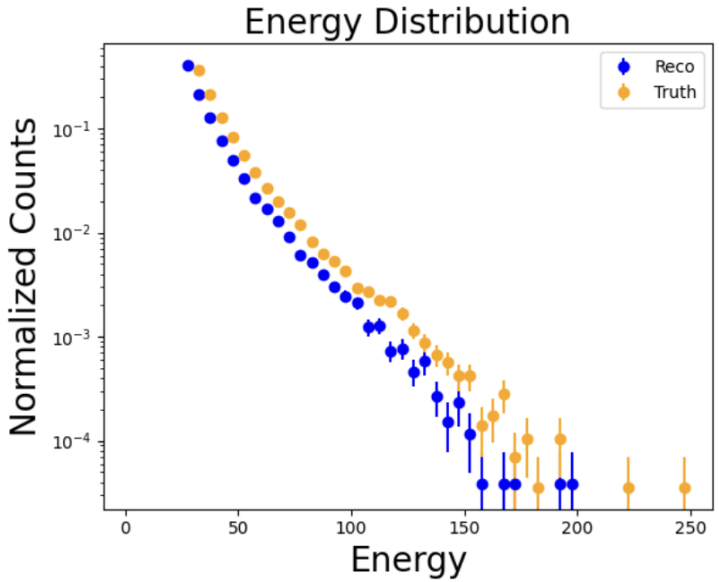


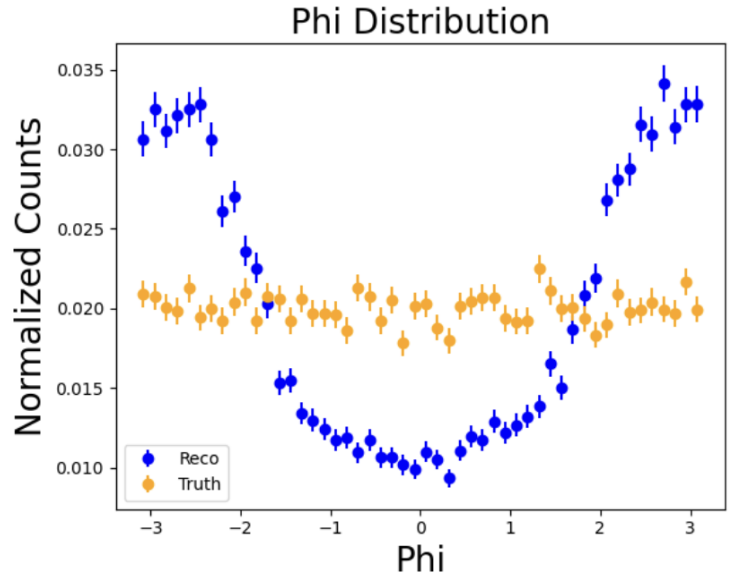
- Clusters beyond eta = 4 are poorly reconstructed, will apply a cut on jet constituents eta > 4

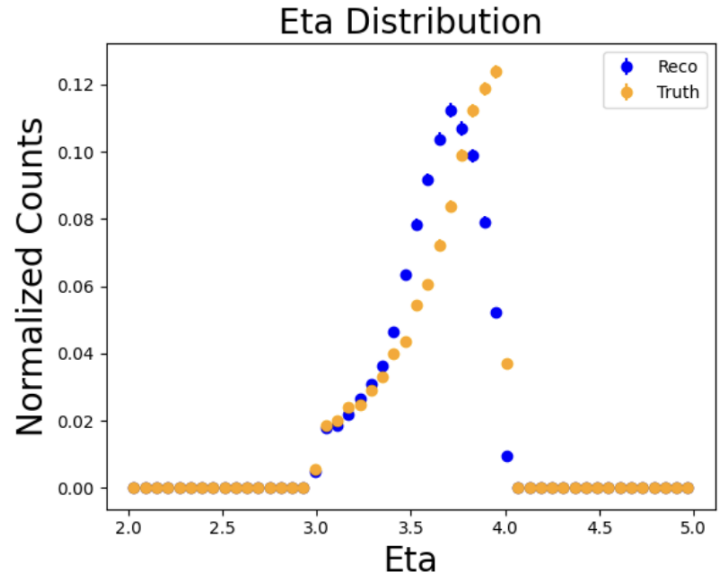
- New jet distributions with new jet constituent cut

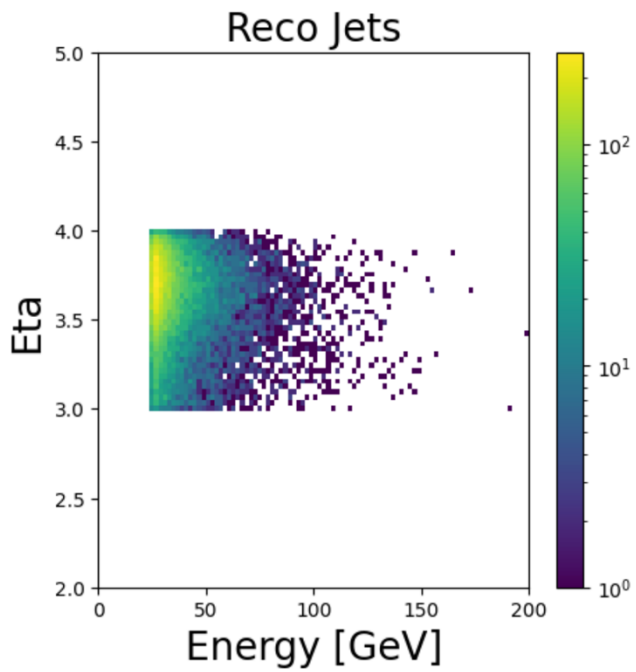


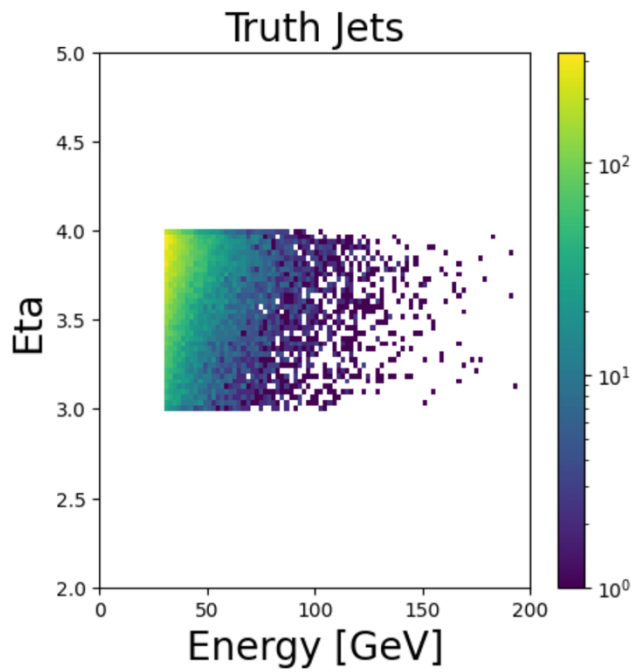



Energy Distribution
Reco
Truth
Normalized Counts
Energy

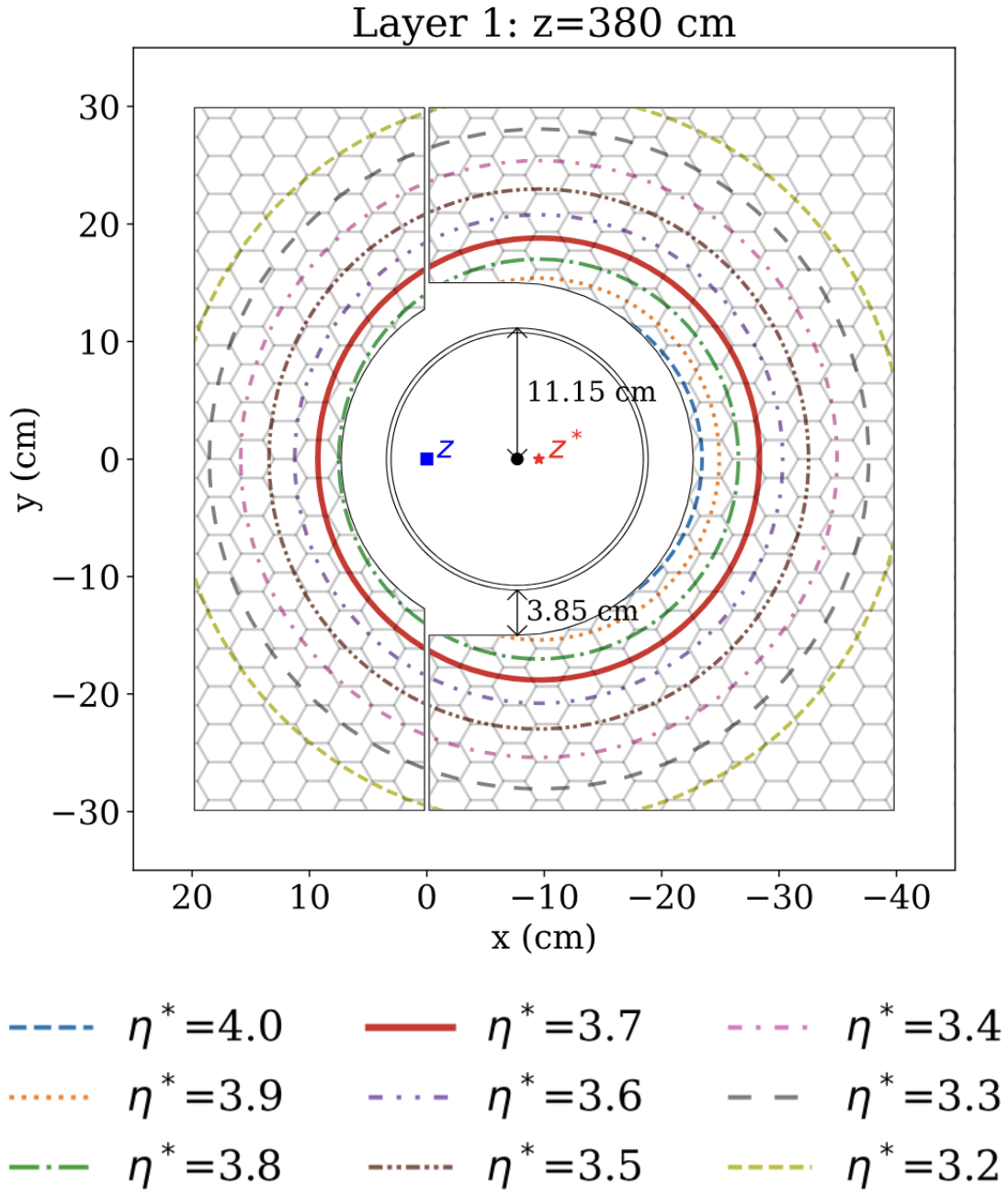

Phi Distribution
Reco
Truth
Normalized Counts
Phi


Eta Distribution
Reco
Truth
Normalized Counts
Eta

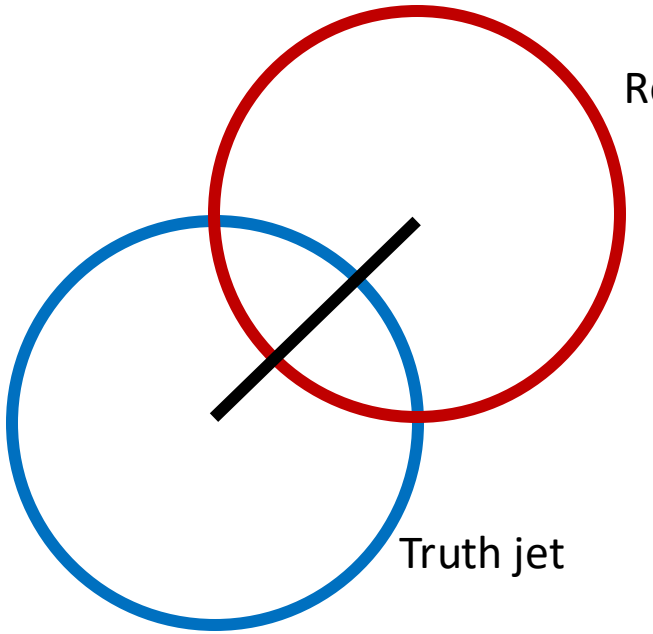

Reco Jets
Eta
Energy [GeV]


Truth Jets
Eta
Energy [GeV]

- Insert covers eta range of 3 – 4
- Analyzed 1M events with min Q2 = 1
- Combines clusters from the LFHCAL, ECal endcap, and ECal + HCal insert
- Jets are defined using anti-kt algorithm with R = 0.4
- Reco level cuts:
  - Min cluster E = 1.5 GeV
  - 3 < eta < 4.5
  - Min jet E = 25 GeV
- Truth level cuts:
  - 3 < eta < 4
  - Min jet E = 30 GeV



- Truth and reco jets are paired by their proximity in eta-phi space
- Max dR = 0.4 (one jet radius)
- 1-to-1 jet matching is enforced
- Total truth jets: 28420
- Total reco jets: 25942
- Total matched jets: 13358
- Jet matching efficiency: 51.5%



$$dR = \sqrt{d\varphi^2 + d\eta^2}$$