CLAS12 DVCS Analysis

- Electron PID
- DVCS
- Path Forward

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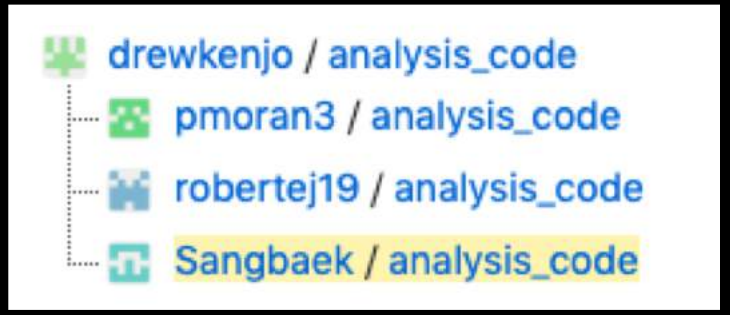
MIT - U. Conn CLAS12 Data Analysis Workshop

Friday September 6 2019

Electron Particle ID

- A side project w/ Bobby, Patrick, and Andrey

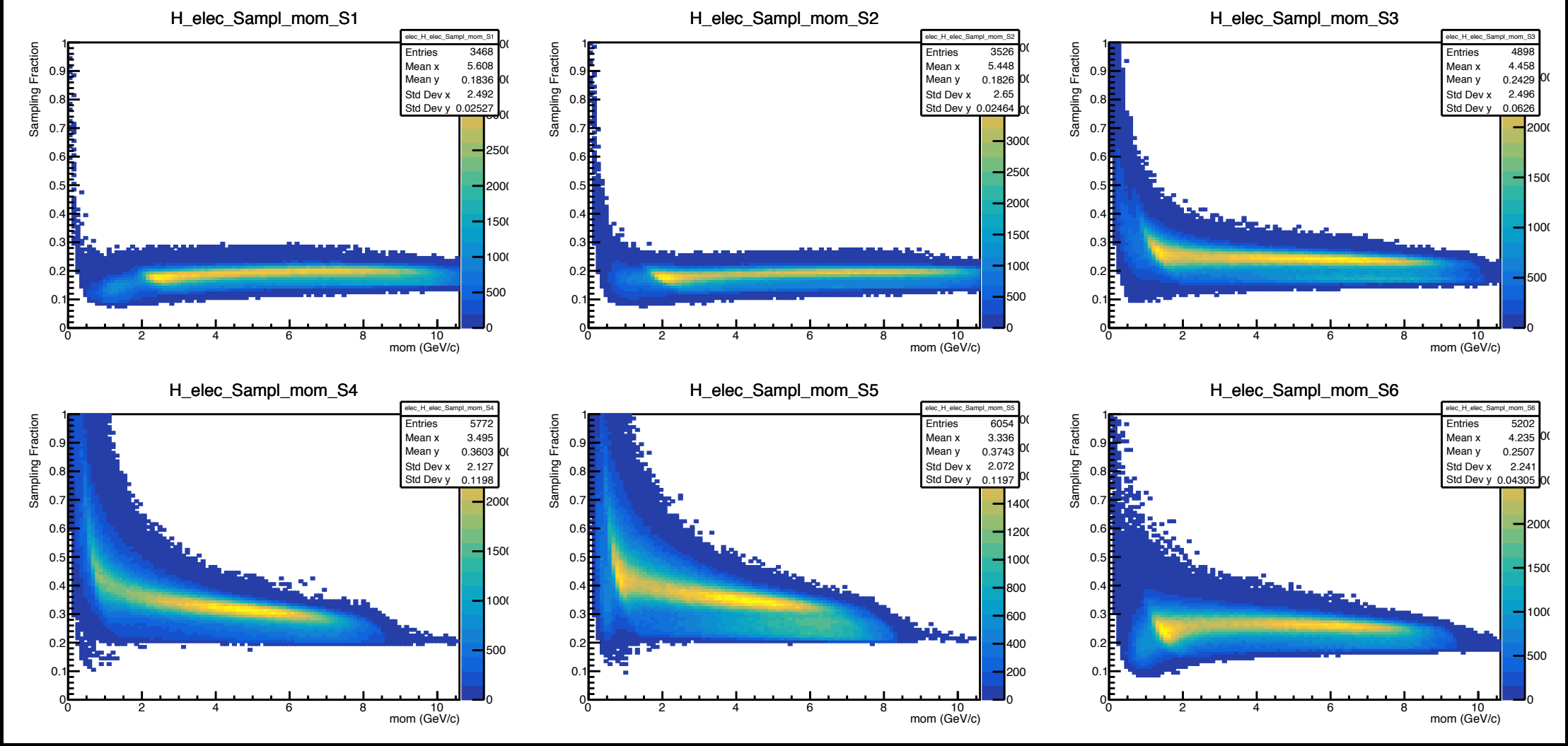


- Plans: to build pID cuts for custom train

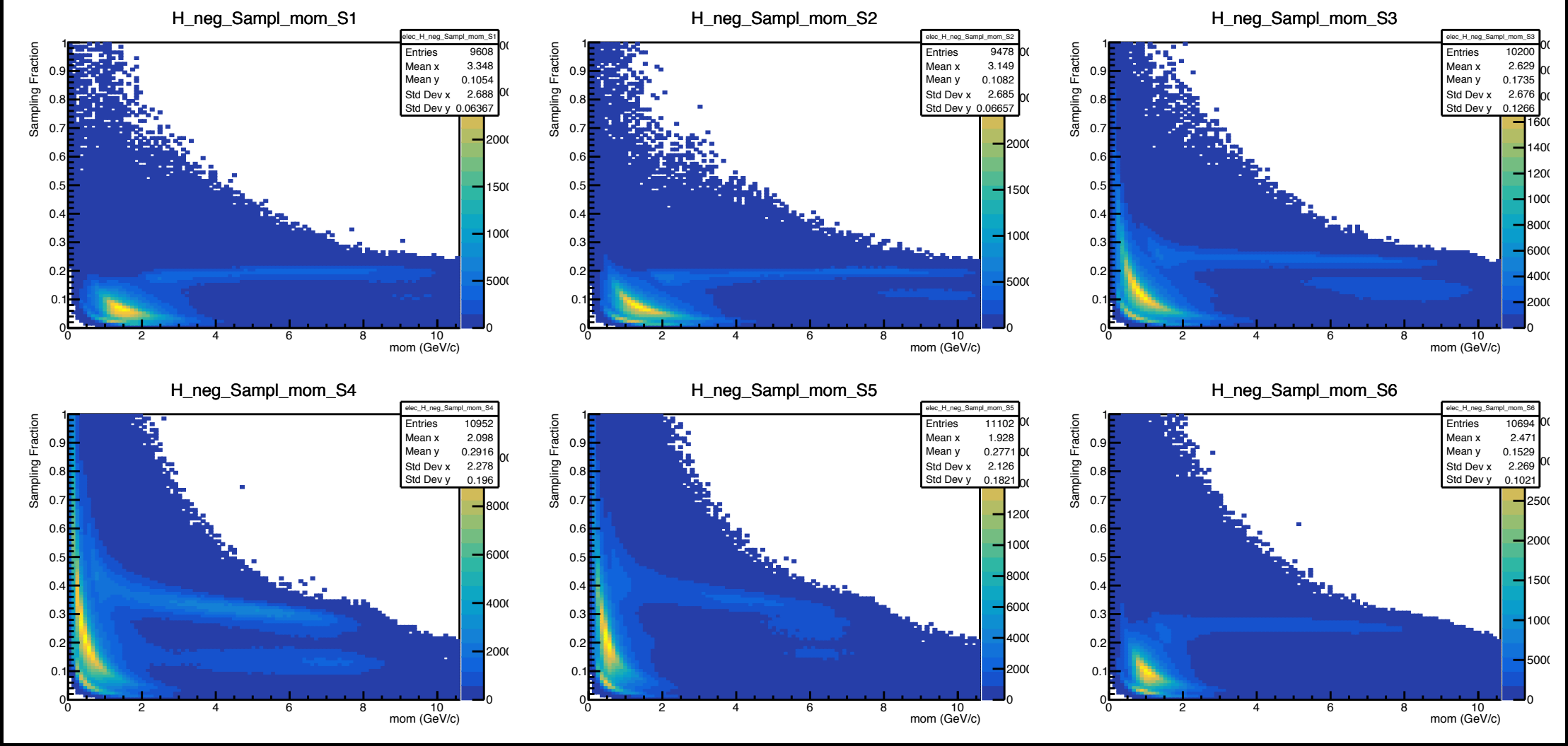
- e.g.) DVCS final state: epγ
  DVπ0P final state: ep$\gamma\gamma$

- Firstly apply preliminary cuts -> look into pid variables

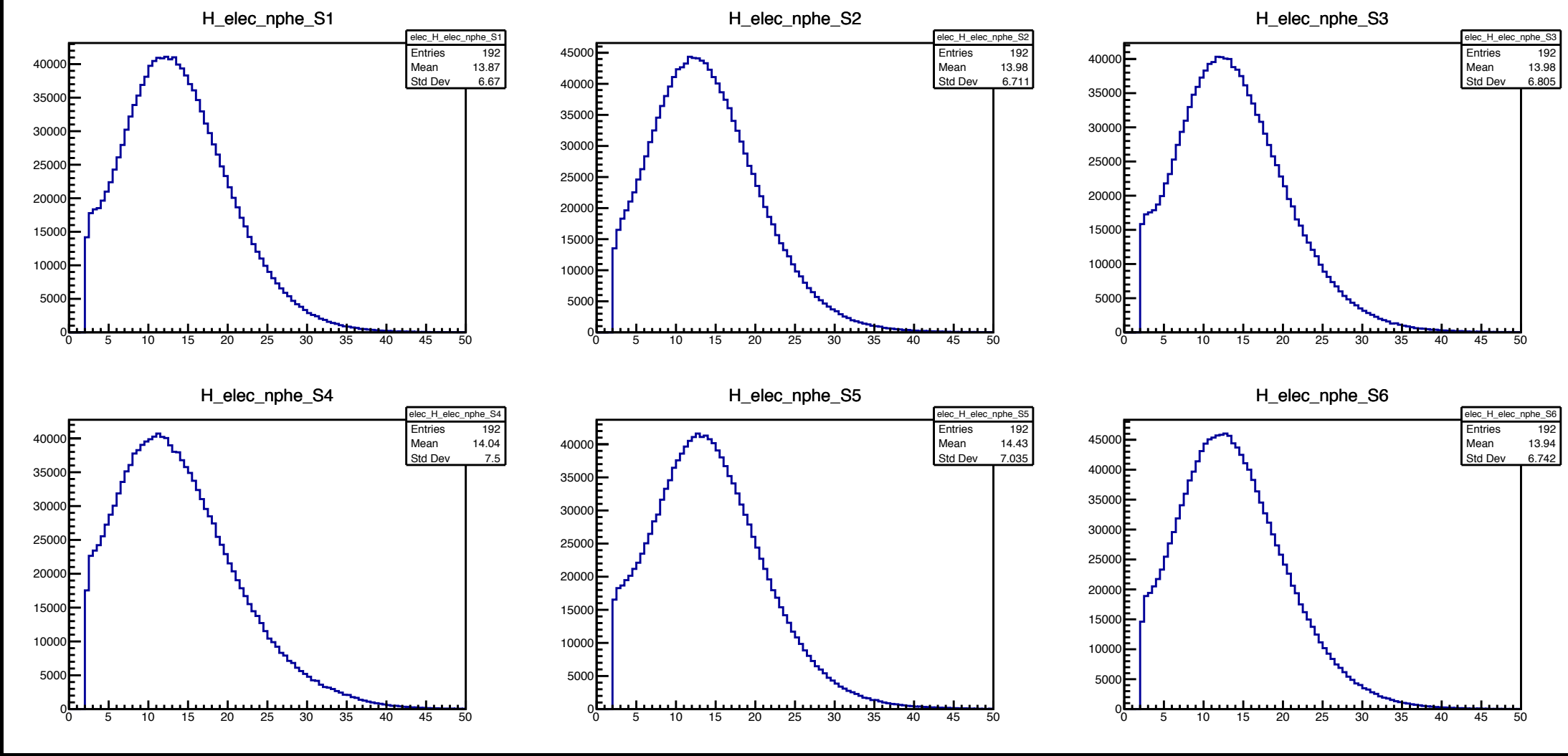
Sampling Fraction – pid==11



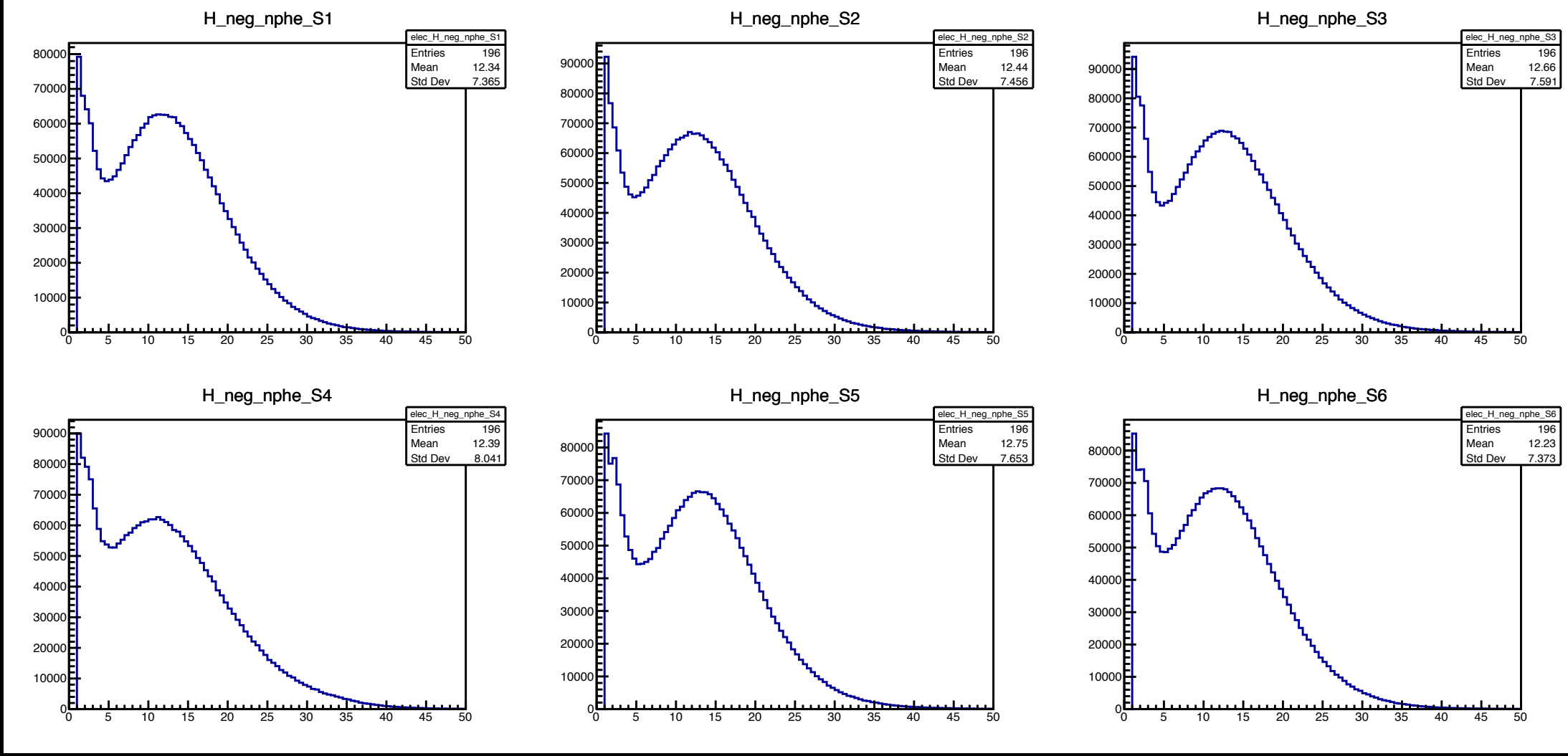
Sampling Fraction – negatively charged



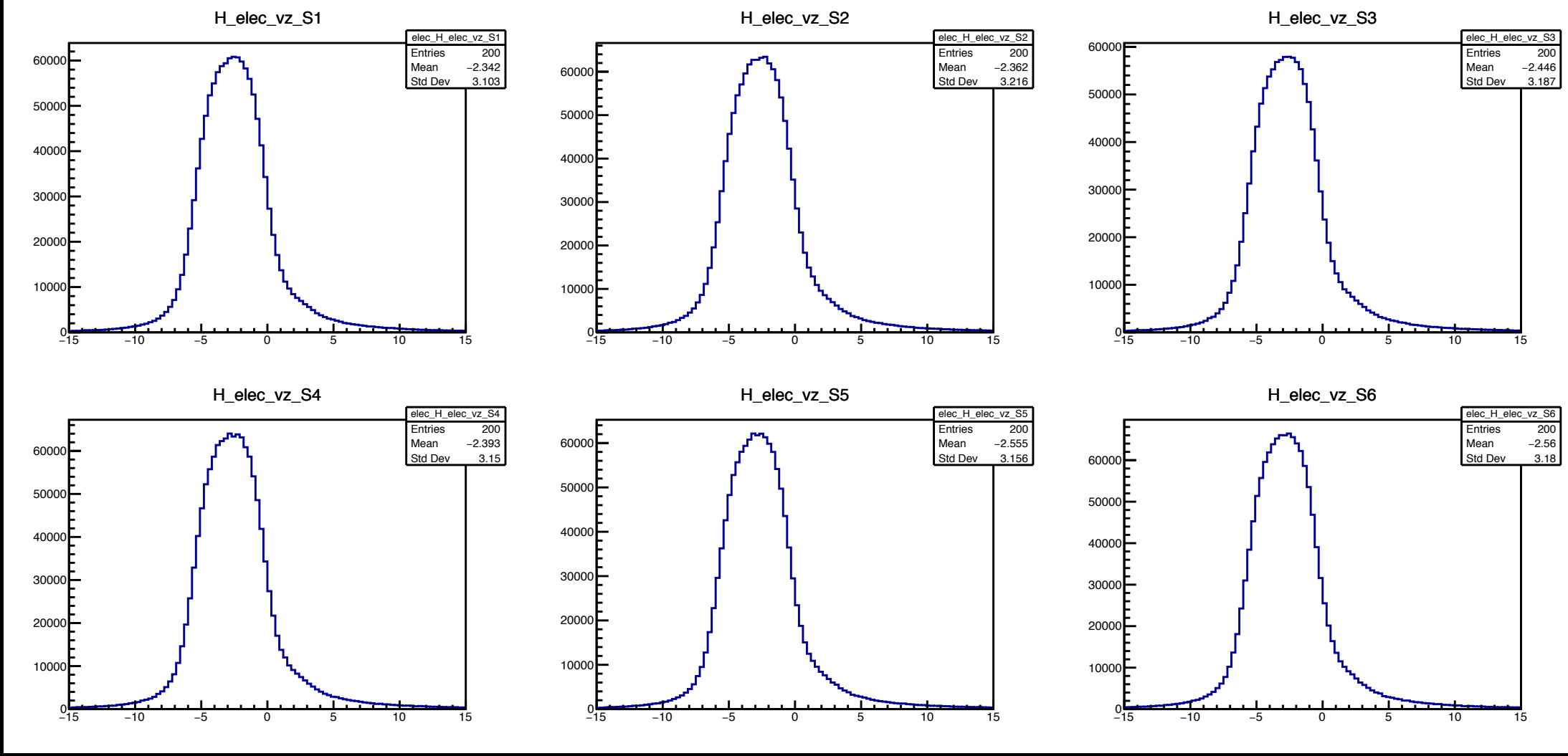
HTCC nphe – pid==11



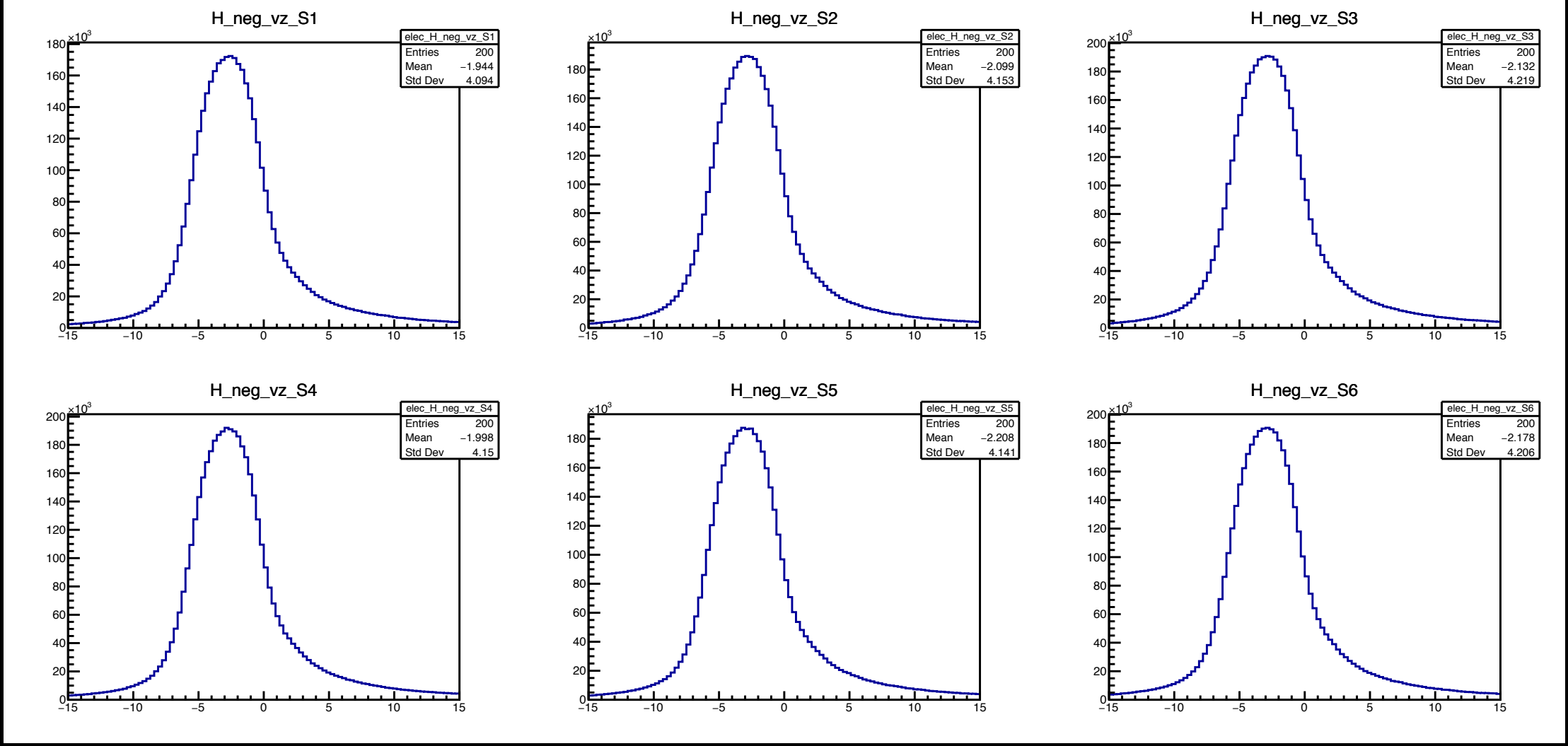
HTCC nphe – negatively charged



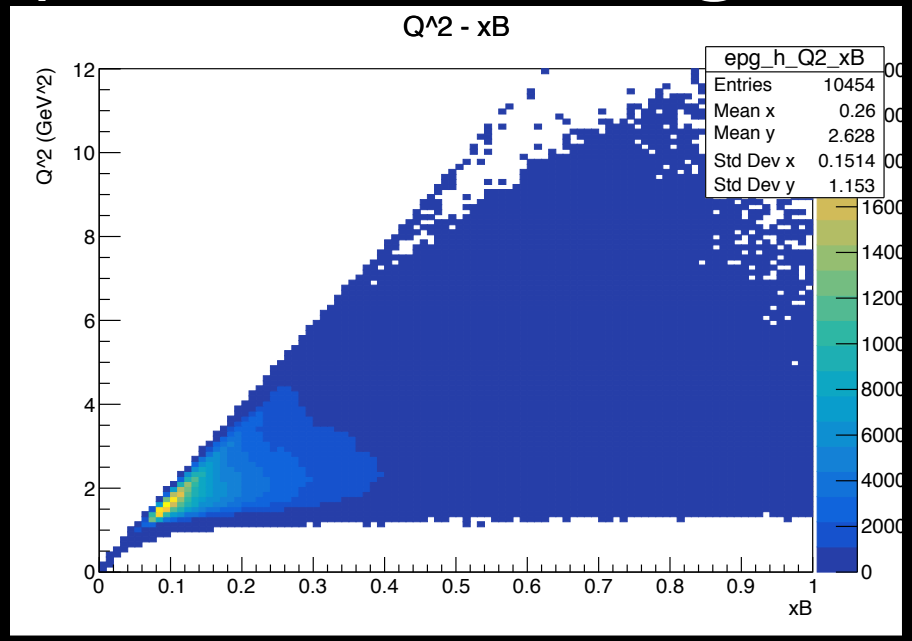
Vertex Position – pid ==11 (target: -3.0 rga fall 2018)

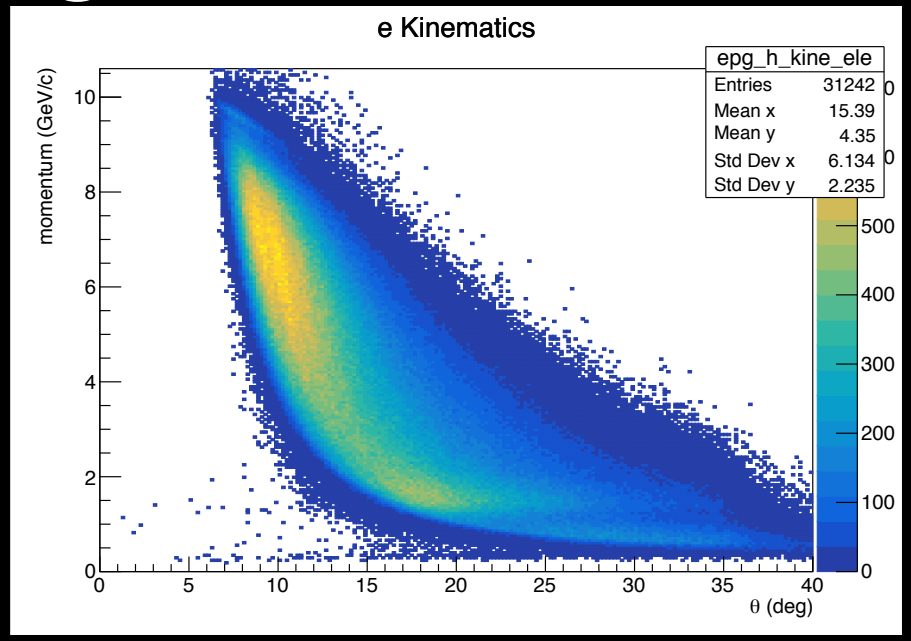


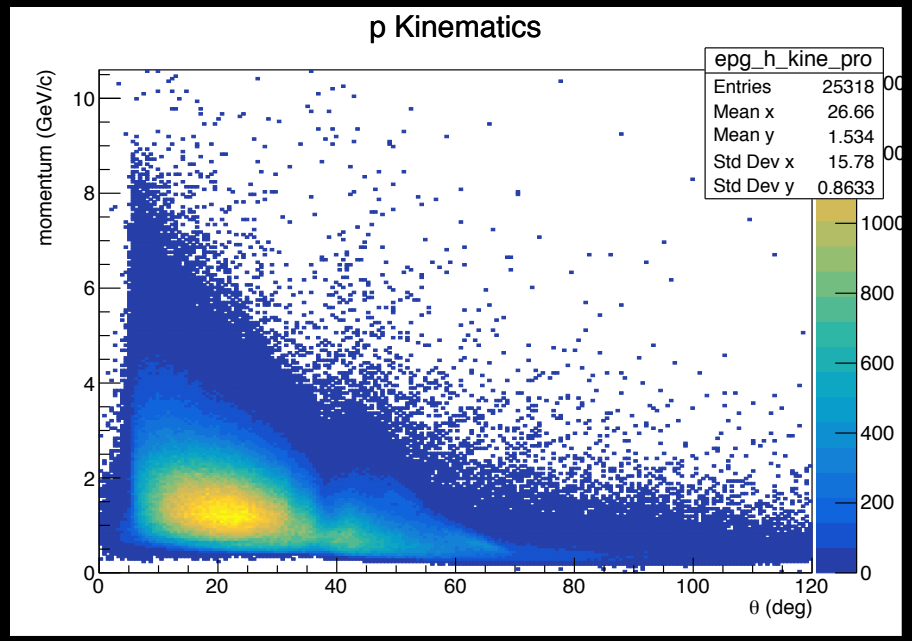
Vertex Position – negatively charged

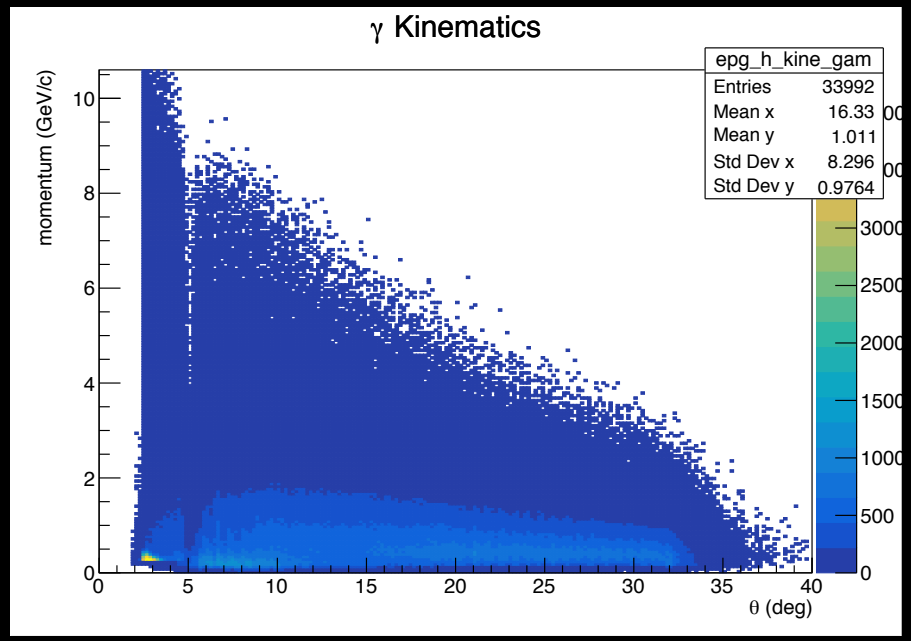


pid==11, negative charge, status

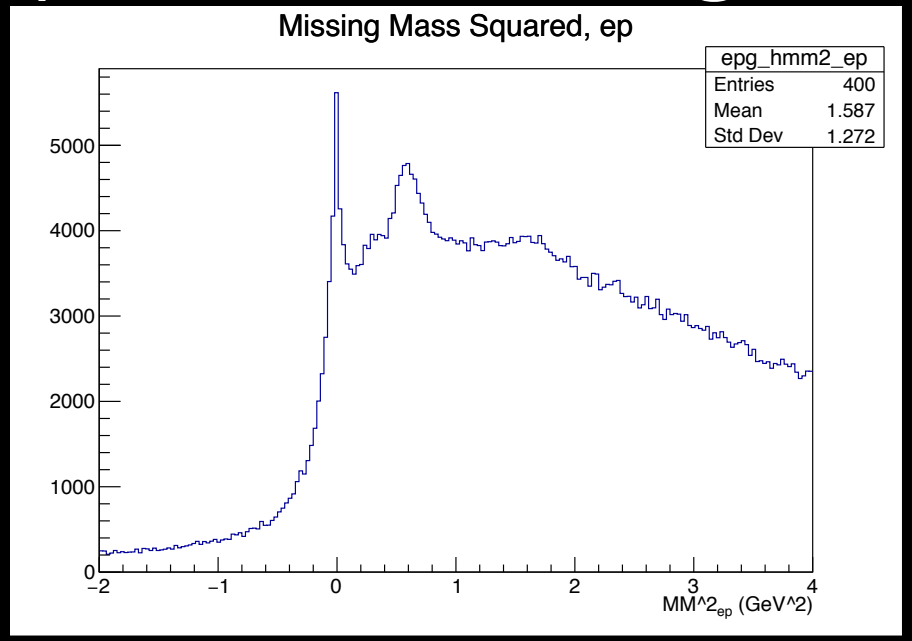


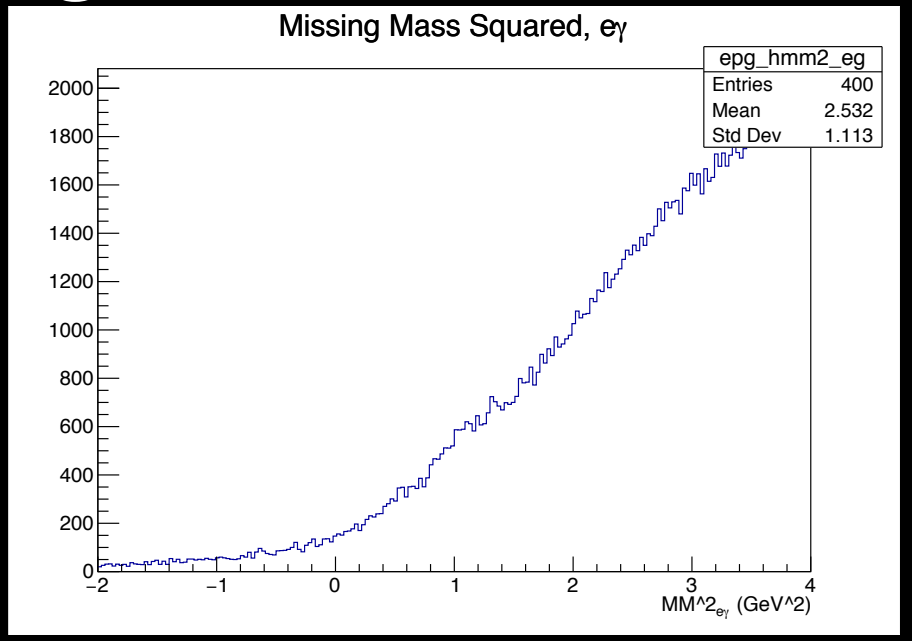


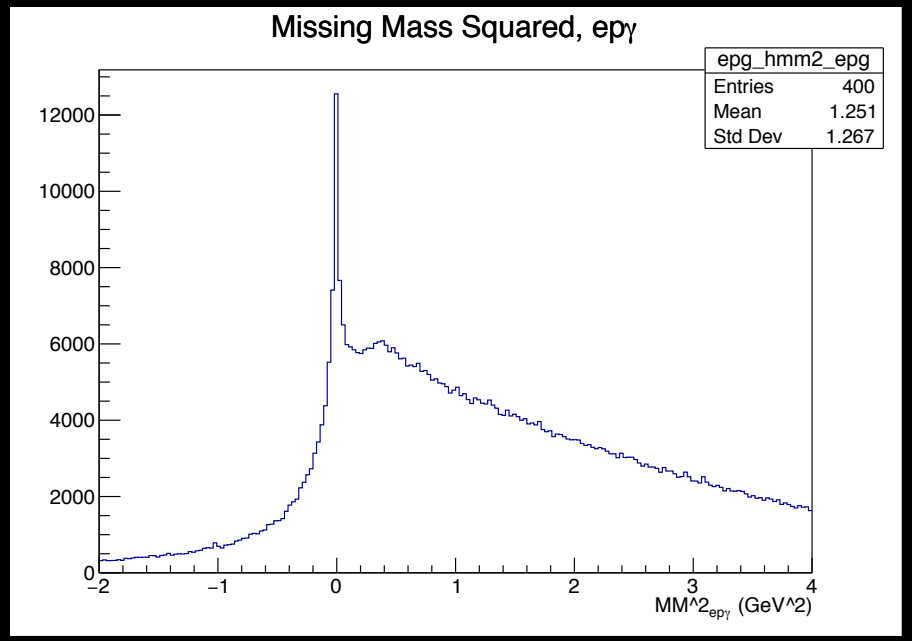


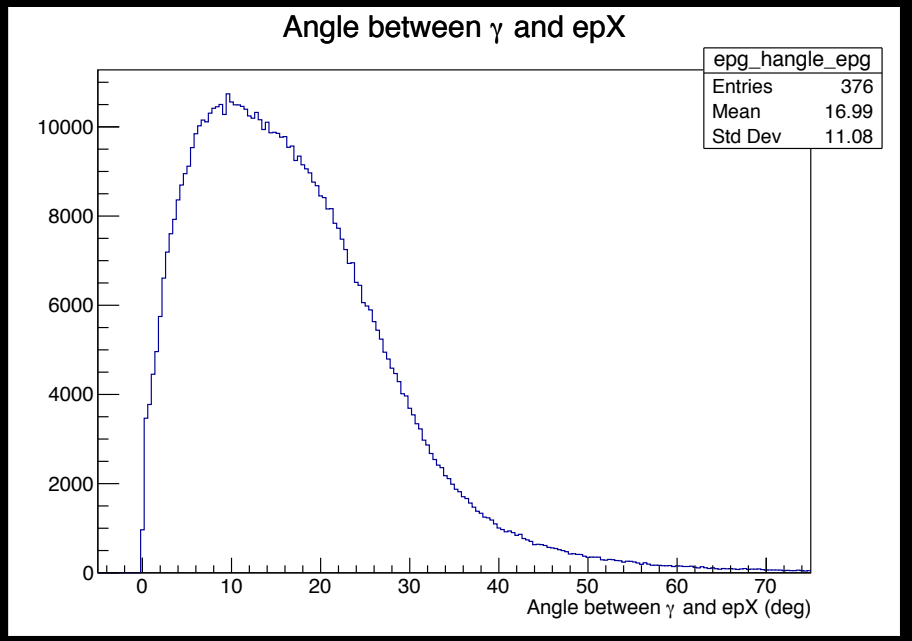


pid==11, negative charge, status

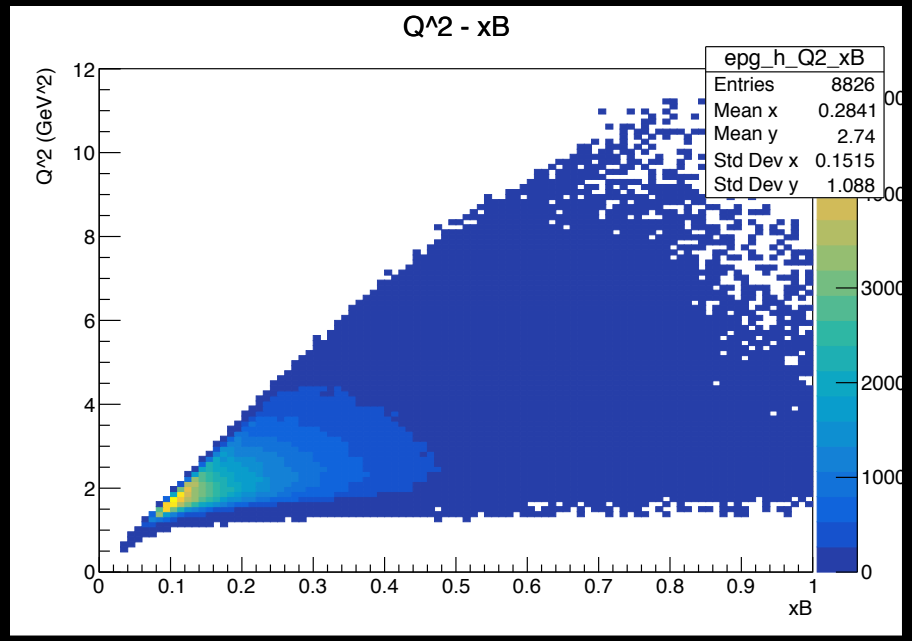


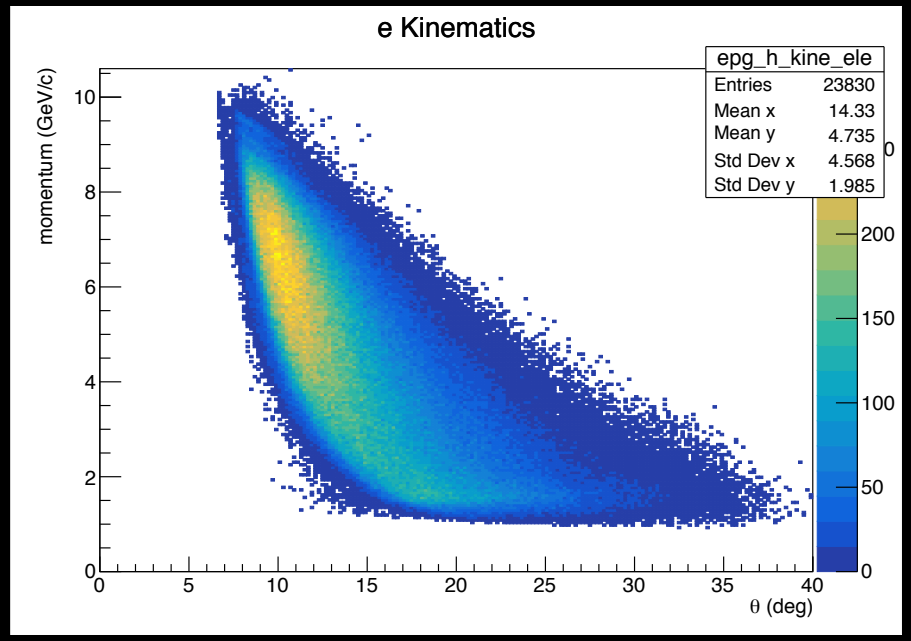


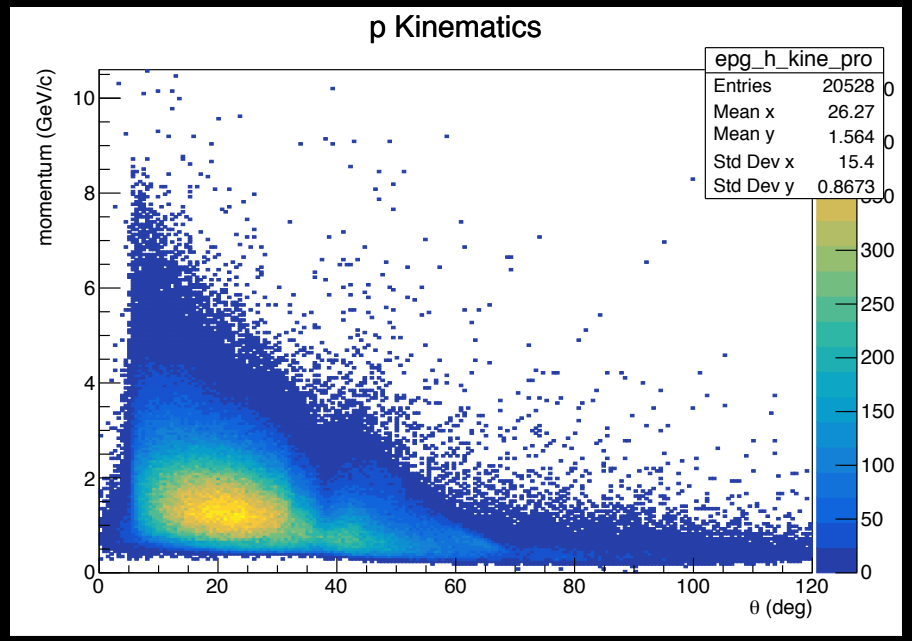


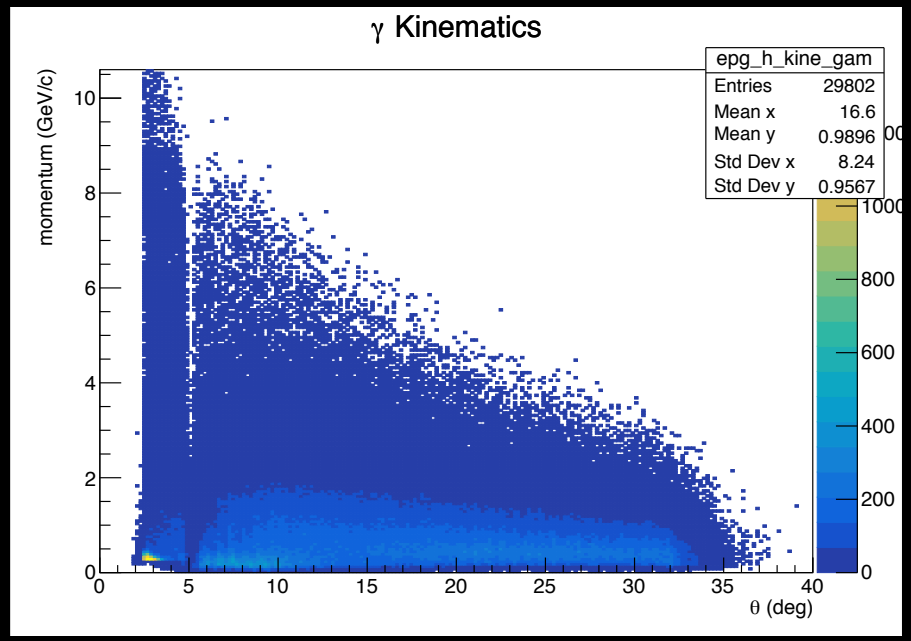


+vz, ftof hit, sampling fraction, nphe, e kinematics









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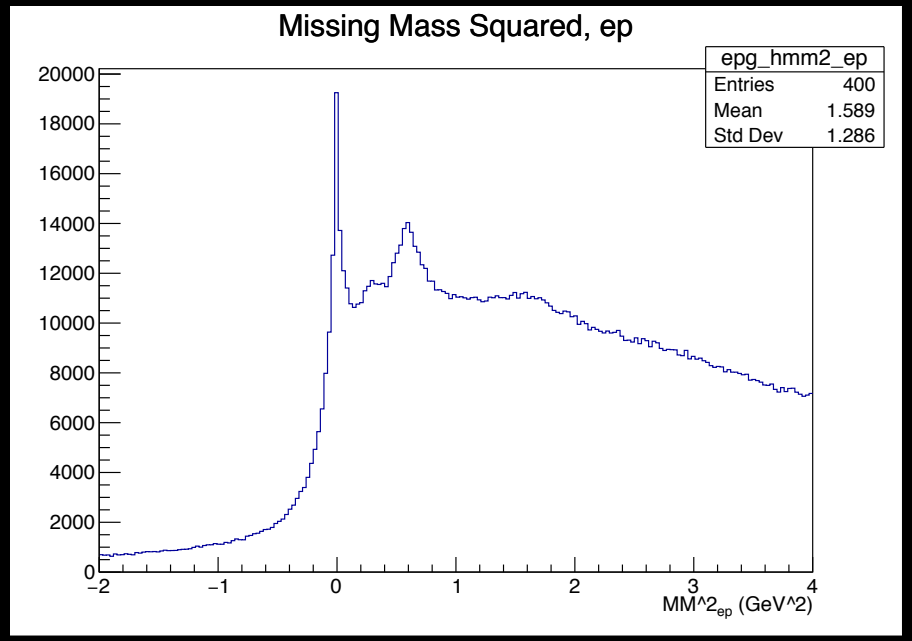
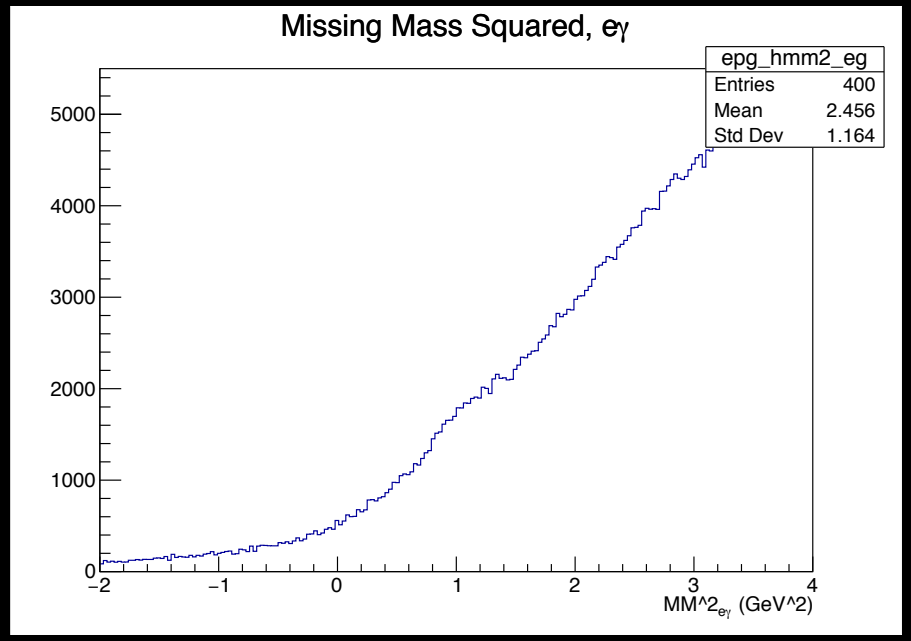
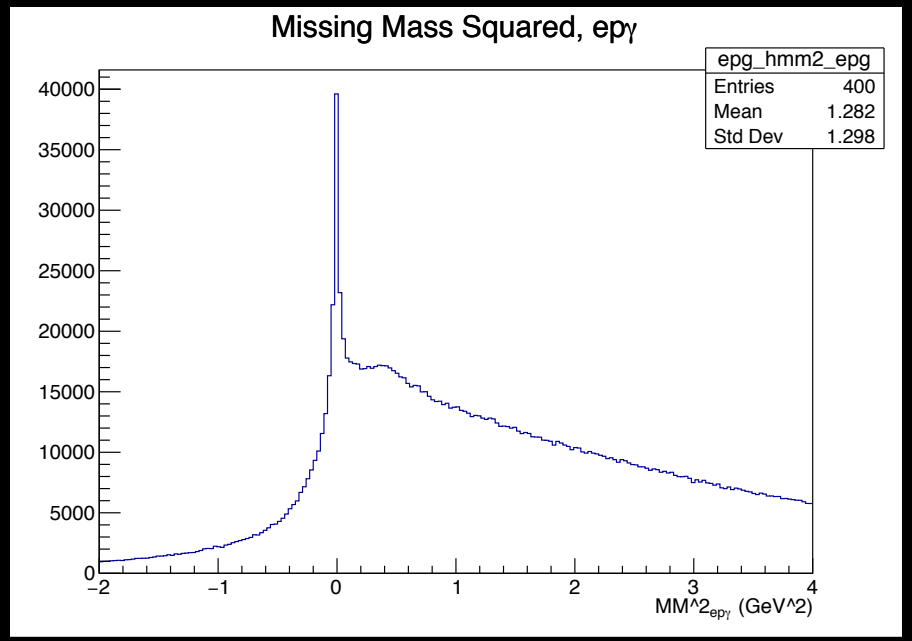
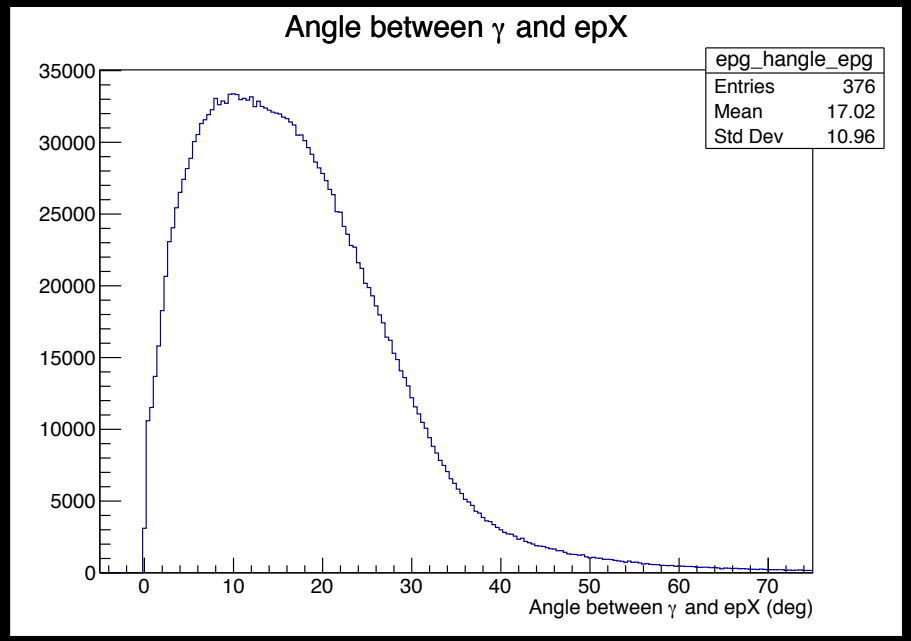








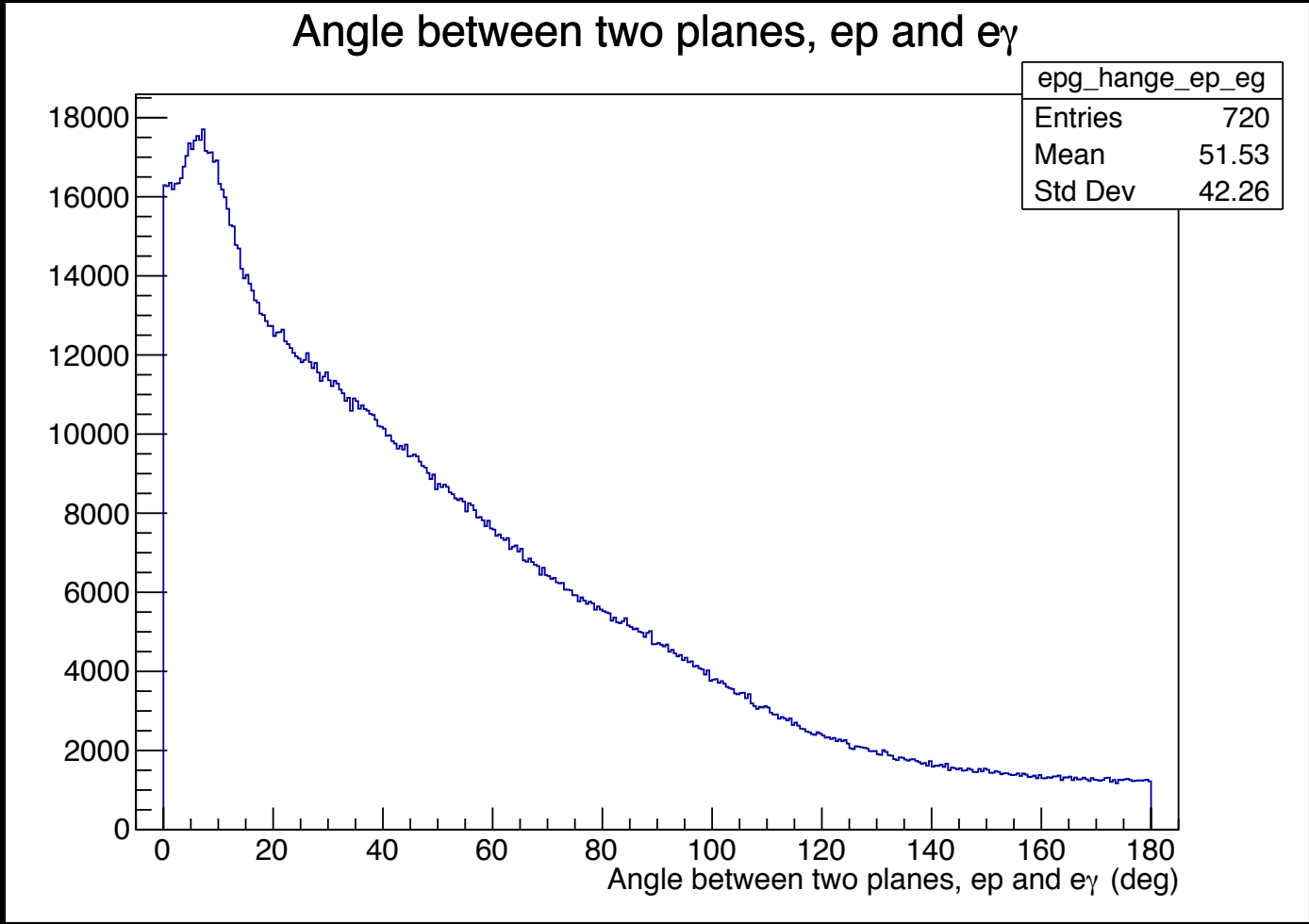
Path Forward

- Improve electron, photon pID
  - Fiducial Cuts
  - Kinematics Cuts
  - Exclusivity Cuts
  - MC Simulation

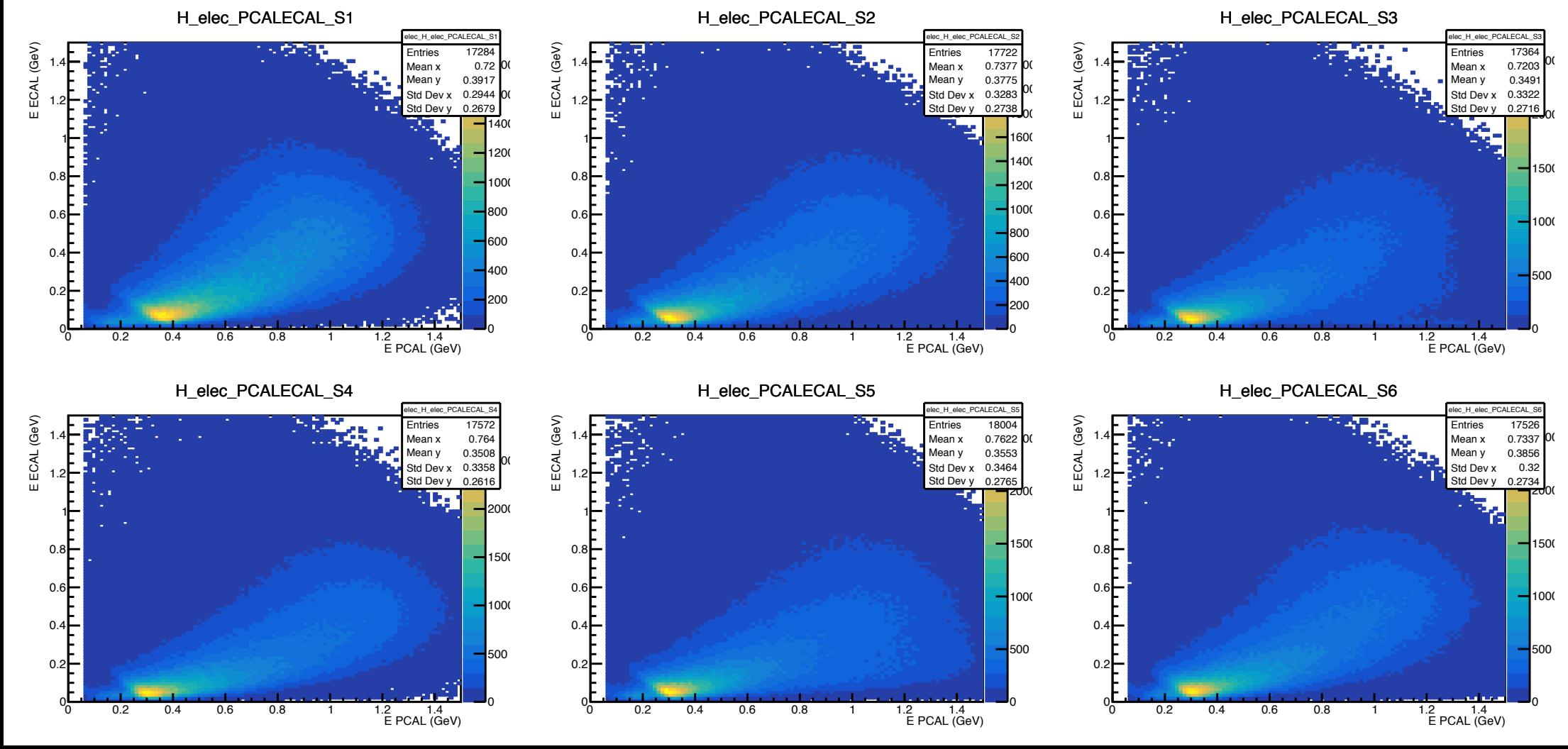
- Collaborate with colleagues!

Backup

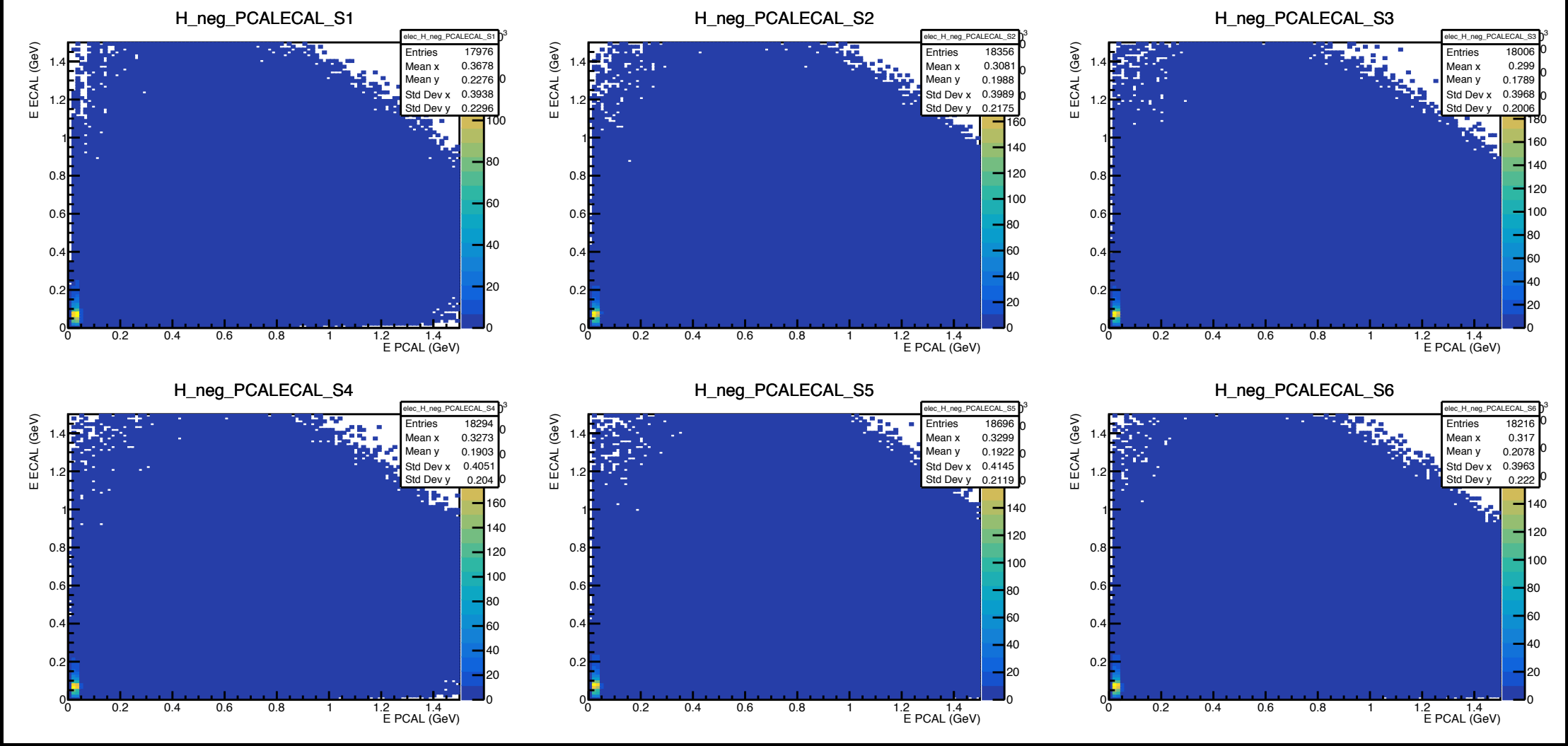
Angle between ep and eγ planes, pid==11, negative charge, status



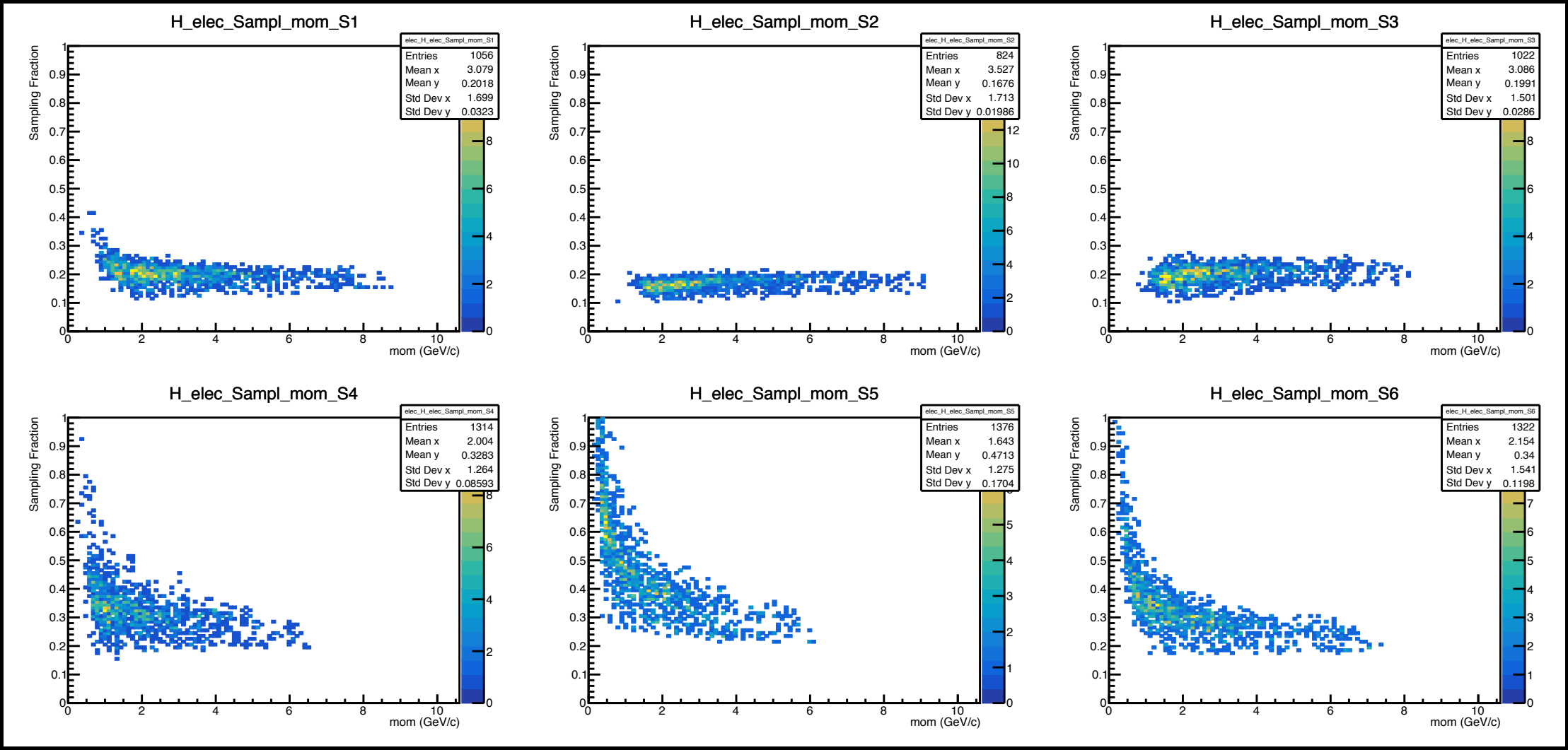
PCAL vs ECAL – pid==11



PCAL vs ECAL – all negatives



MC Study – Sampling Fraction



Related URLs

- http://www.lns.mit.edu/~sangbaek/elec_MC.pdf
- http://www.lns.mit.edu/~sangbaek/elec_5038_train.pdf
- http://www.lns.mit.edu/~sangbaek/elec_5038_dst.pdf

- https://github.com/Sangbaek/analysis_code