Progress Update

Trevor Towstego

2-Ring ν_e CC1π^+ Meeting

October 31, 2018

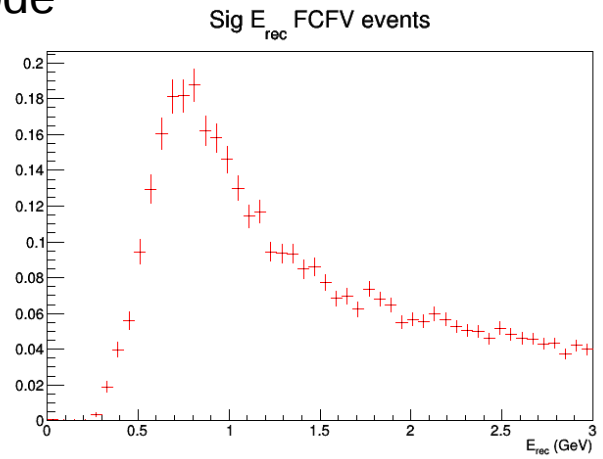
Kinematic Response Plots

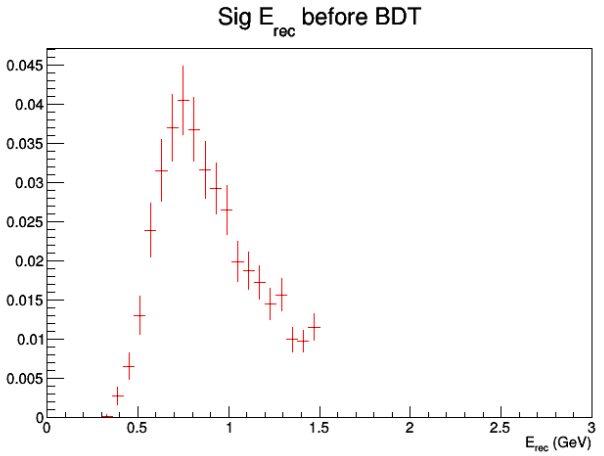
v1 trial 8 (best grid search architecture)

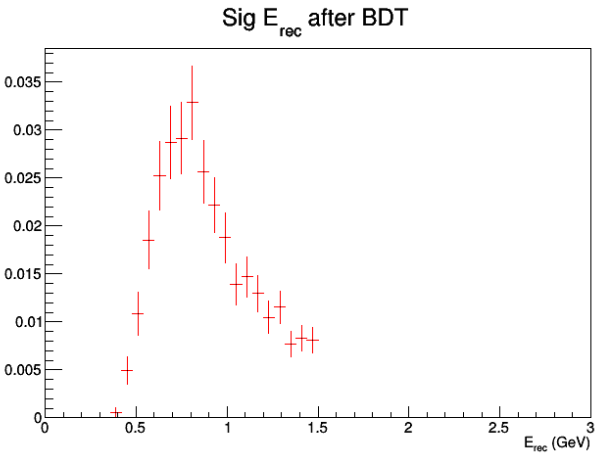
- Signal ($1e1\pi^{+/-}$):
  - E_{rec}, E_{ν}, E_{res}
  - p_e^{rec}, p_e^{tru}, p_e^{res}
  - p_{π}^{rec}, p_{π}^{tru}, p_{π}^{res}
  - $\cos(\theta_{e\pi}^{rec})$, $\cos(\theta_{e\pi}^{tru})$, $\cos(\theta_{e\pi})^{res}$
- Background (not shown):
  - E_{rec}, E_{ν}, E_{res}
  - p_e^{rec}
  - p_{π}^{rec}
  - $\cos(\theta_{e\pi}^{rec})$
- Stacked histograms (by final state particles)
  - E_{rec}, E_{ν}, E_{res}
  - p_e^{rec}
  - p_{π}^{rec}
  - $\cos(\theta_{e\pi}^{rec})$
- 3 sets of plots (for each 0de and 1de):
  - FCFV cut
  - pre-BDT cuts
  - post-BDT

Signal E_{rec}

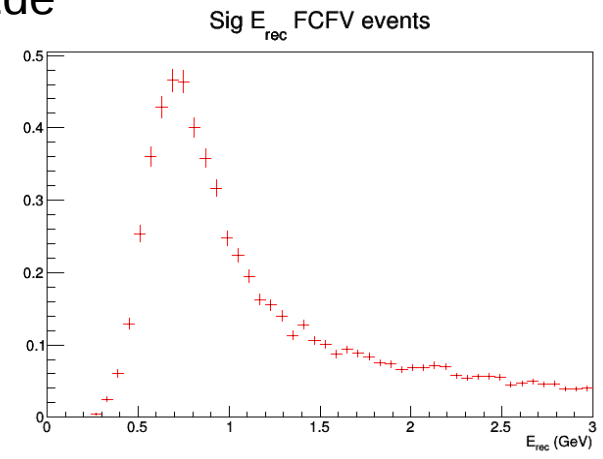
0de

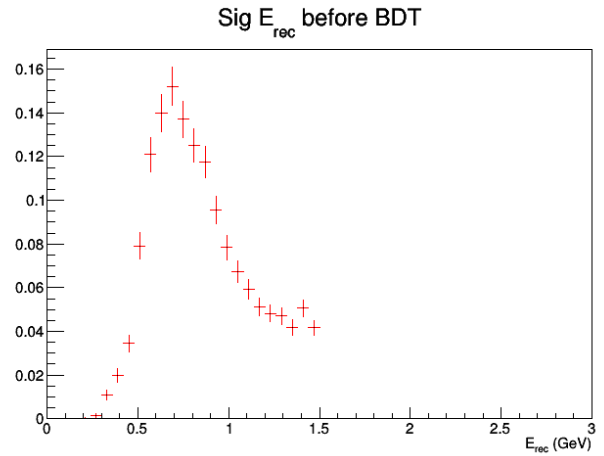


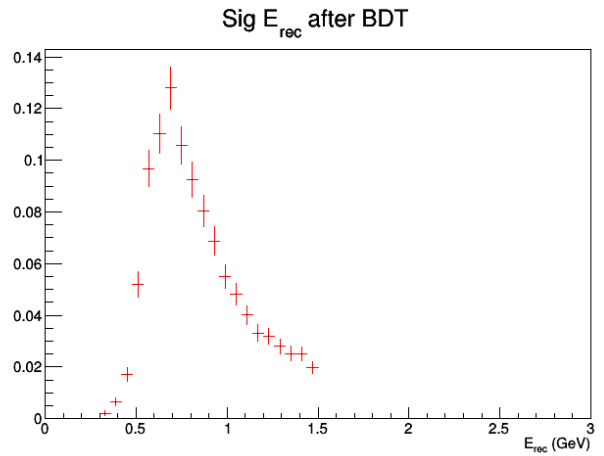




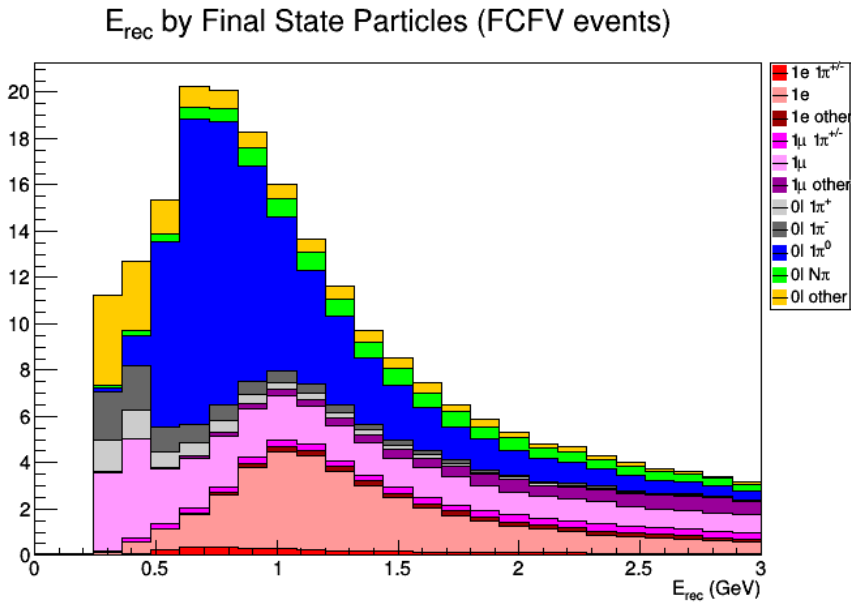
1de

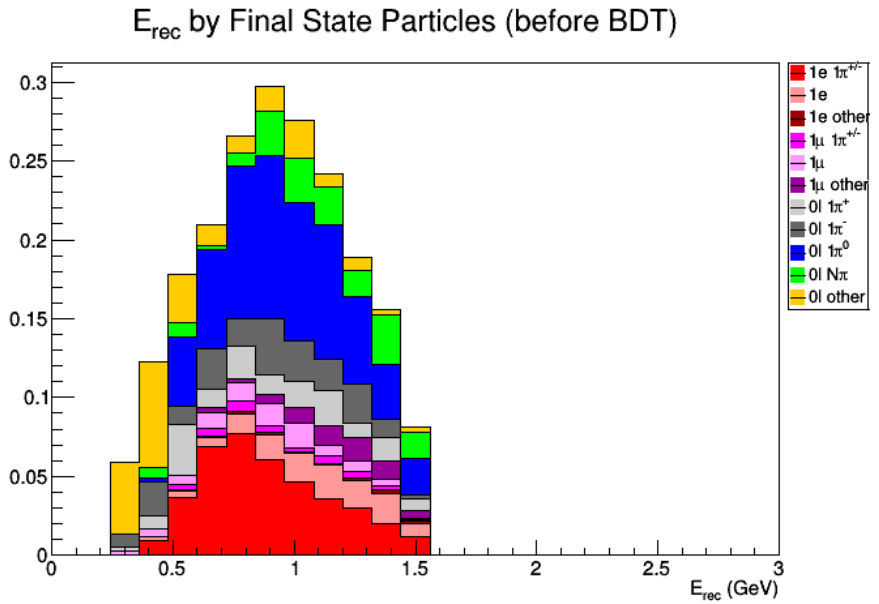


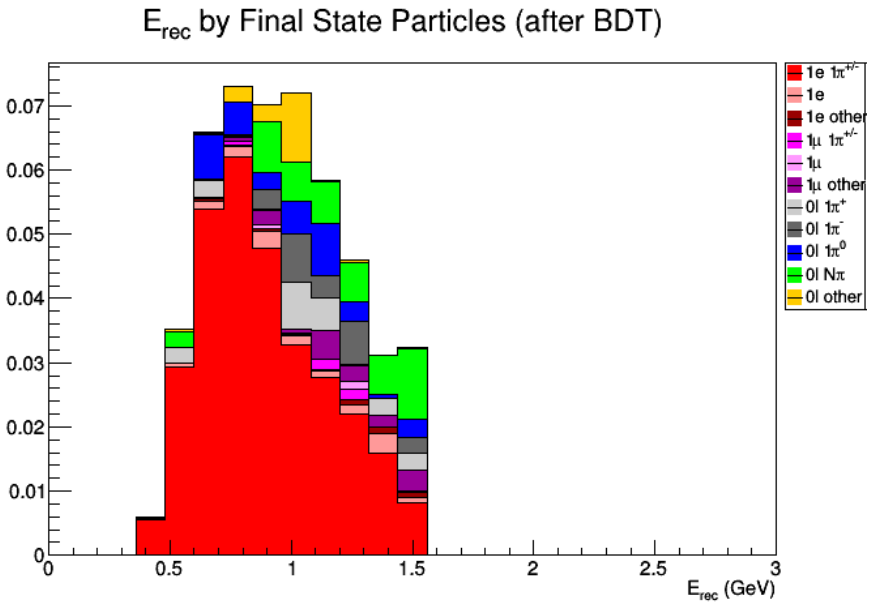




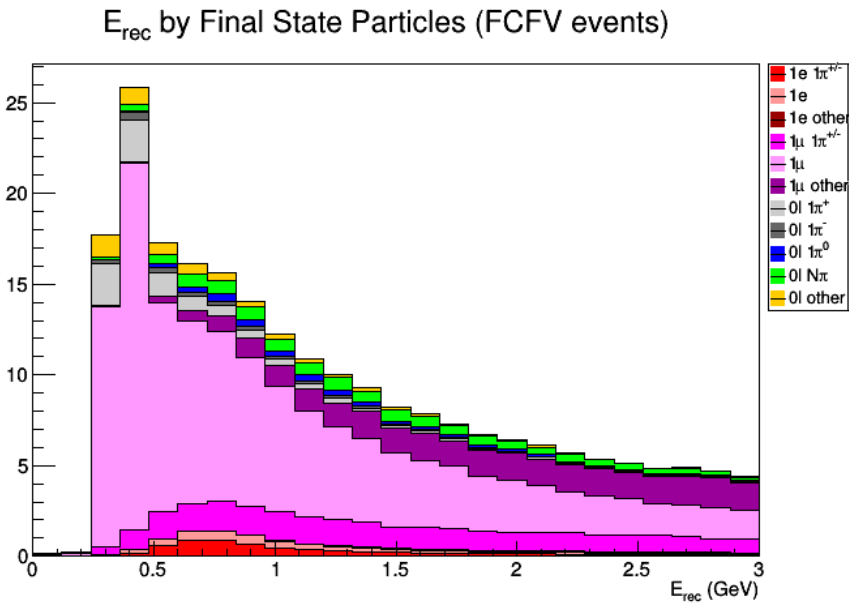
Stacked E_{rec} (0de)

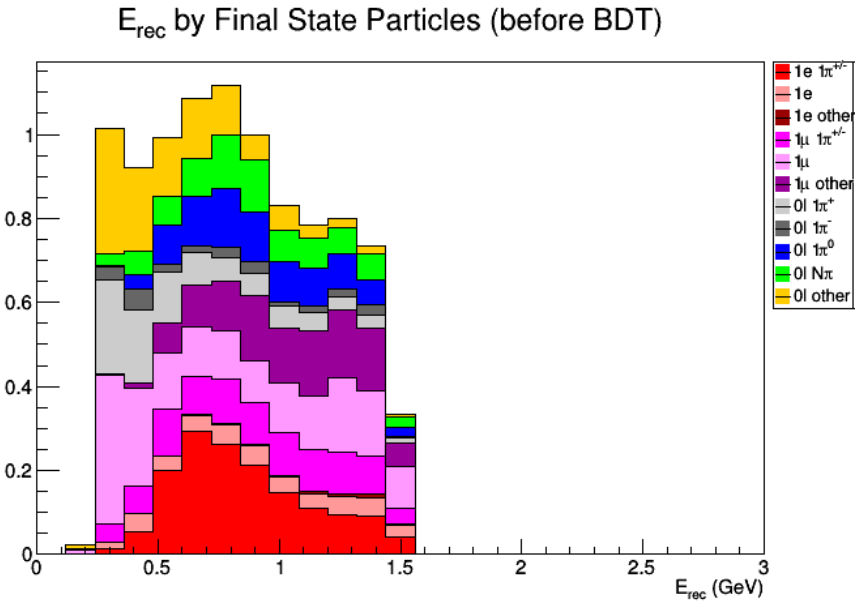


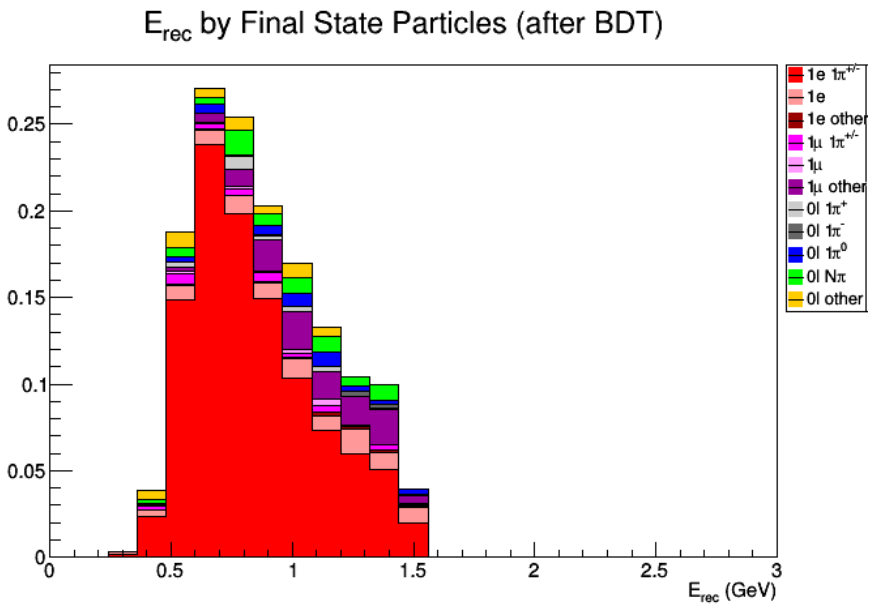




Stacked E_{rec} (1de)

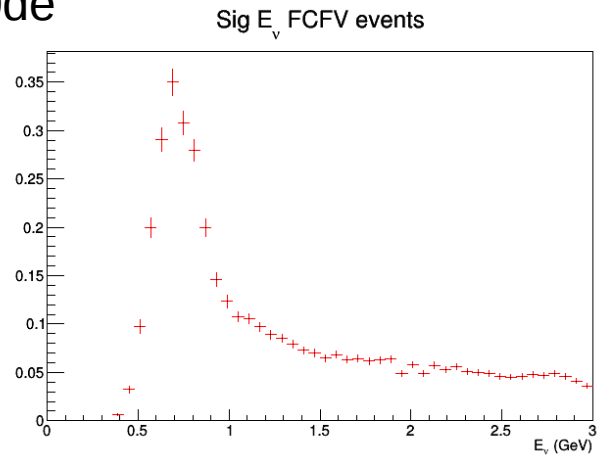


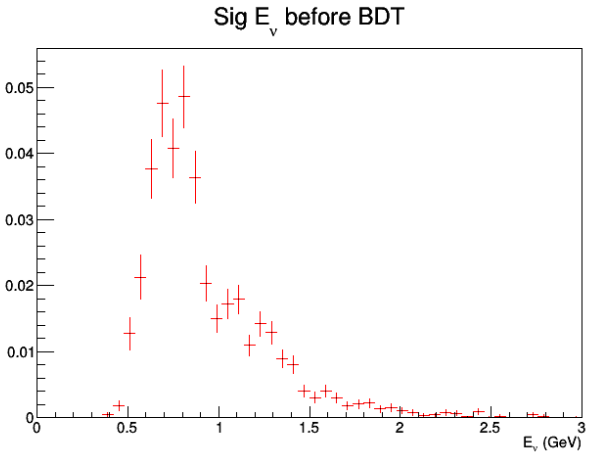


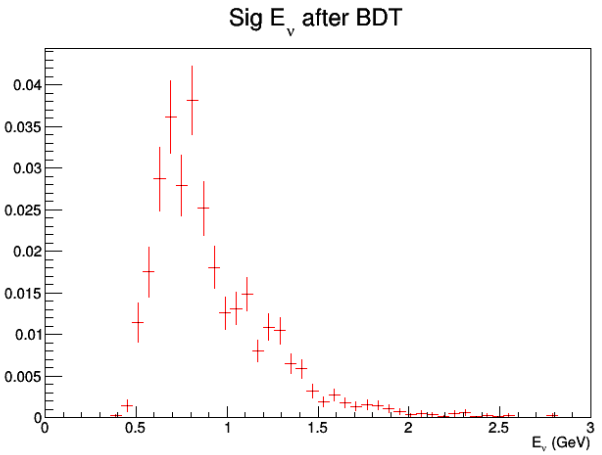


Signal E_ν

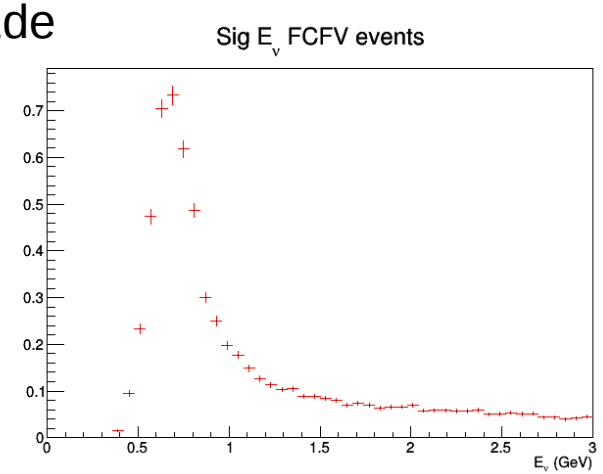
0de

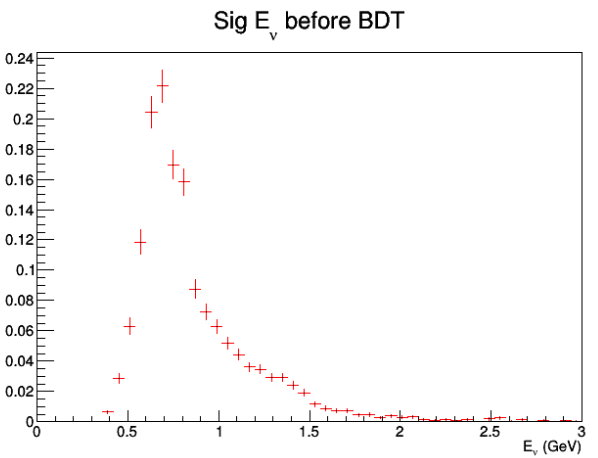


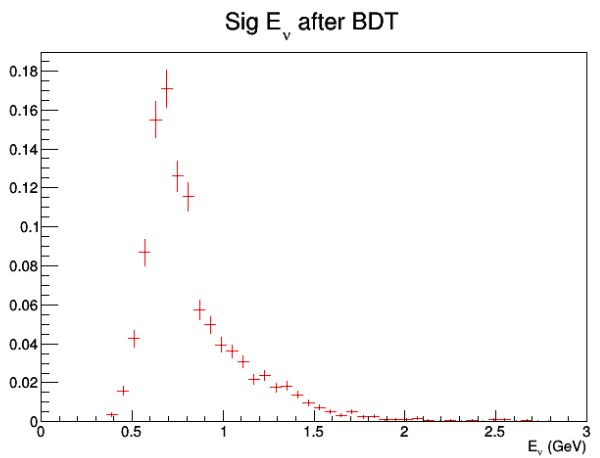




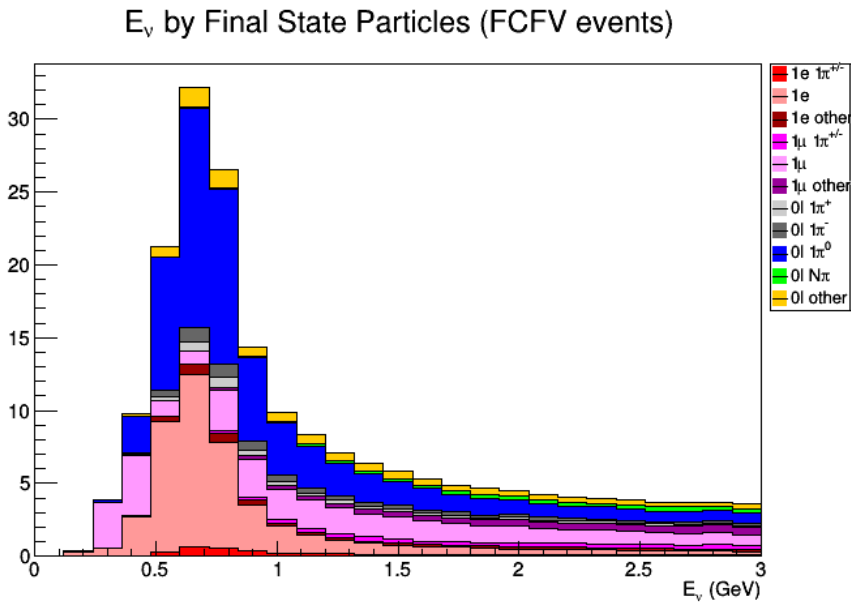
1de

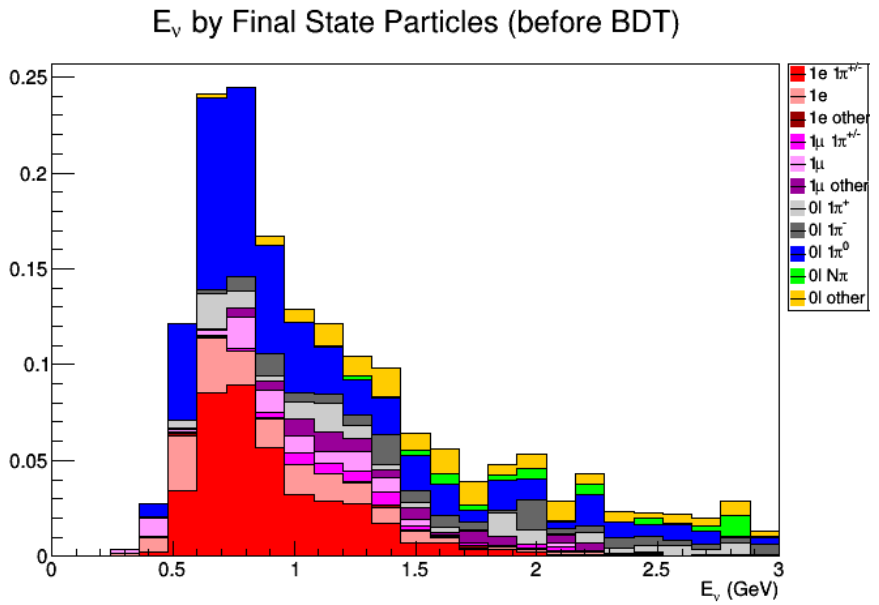


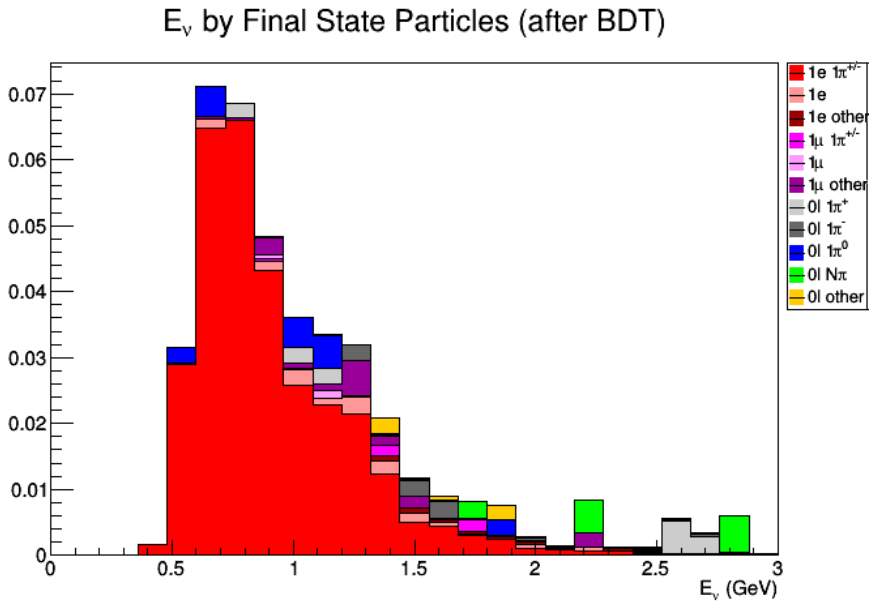




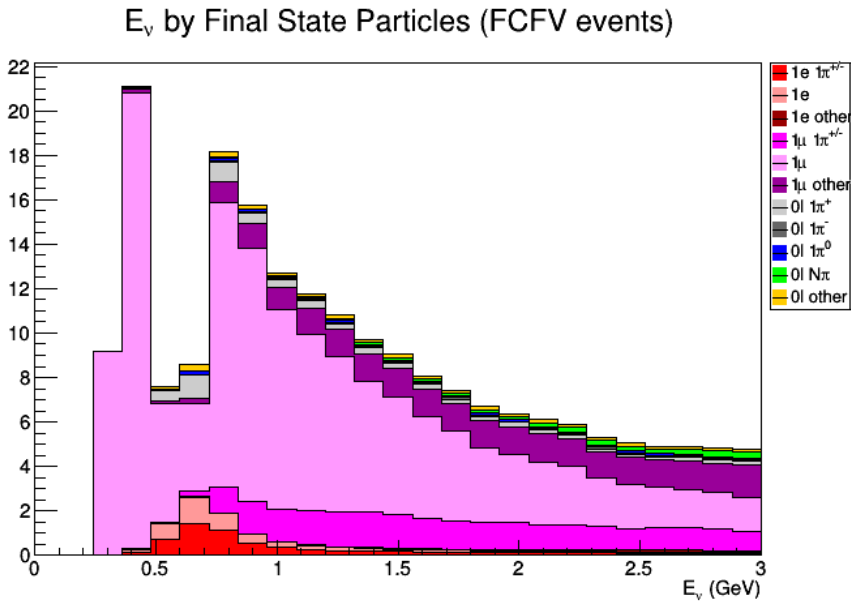
Stacked E_ν (0de)

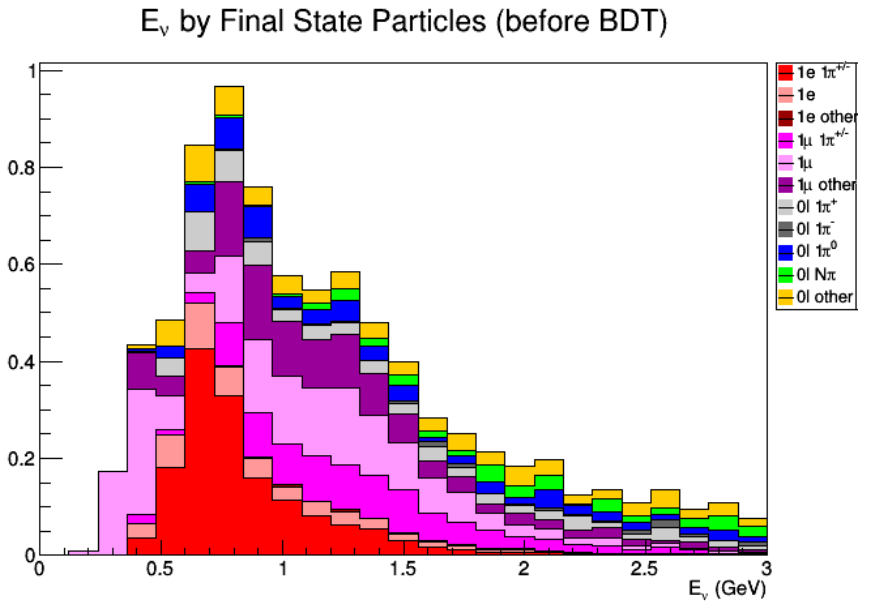


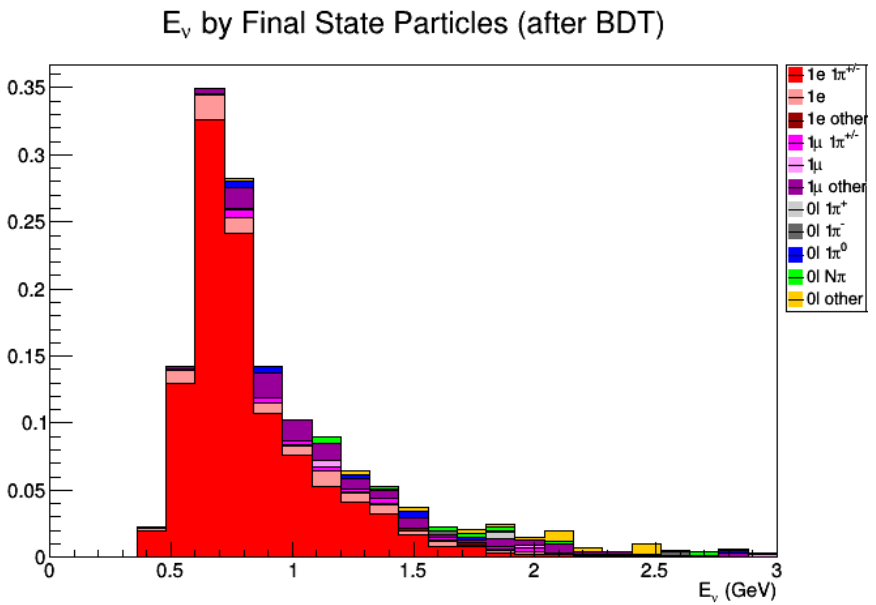




Stacked E_ν (1de)

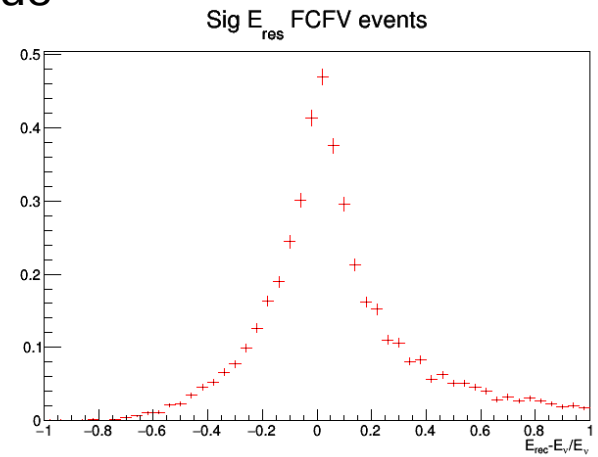


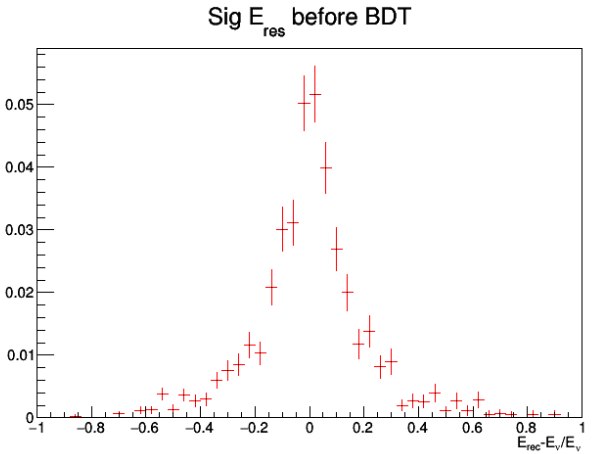


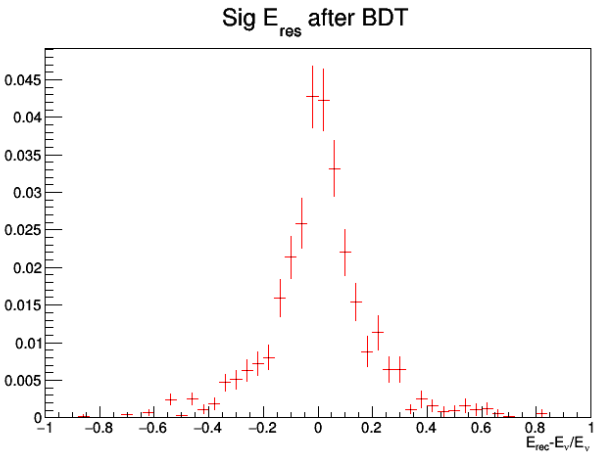


Signal E_{res}

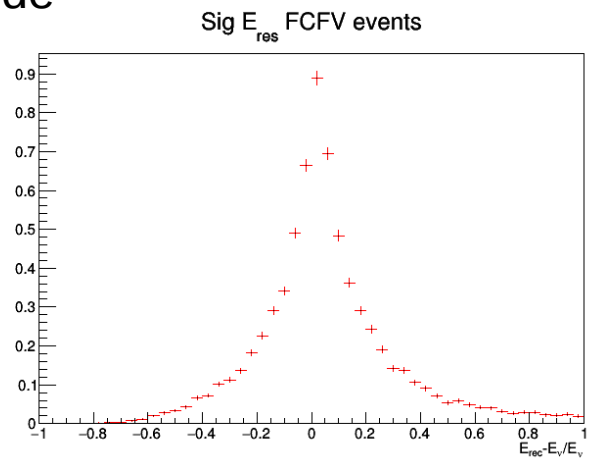
0de

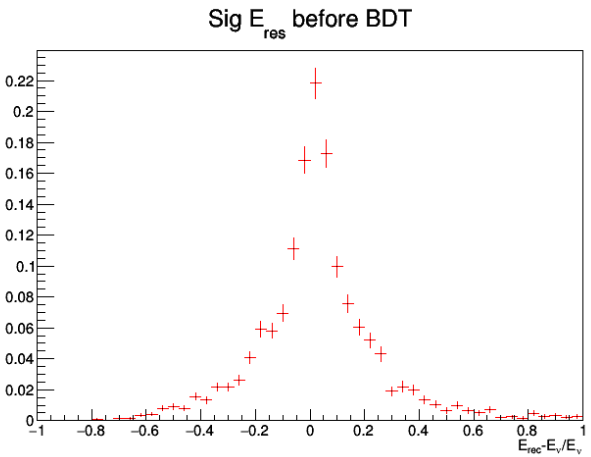


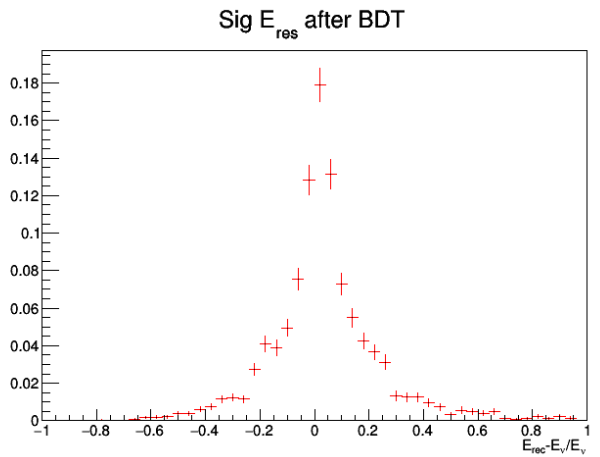




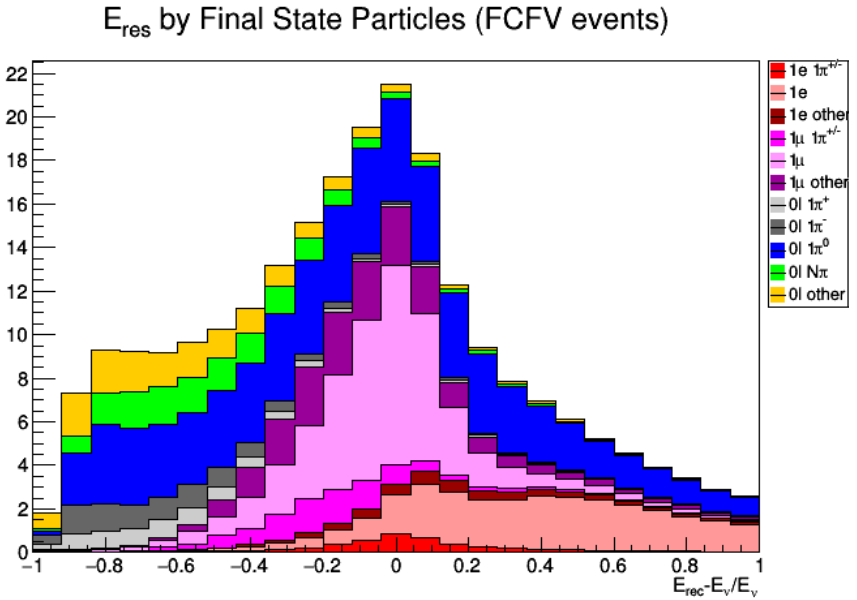
1de

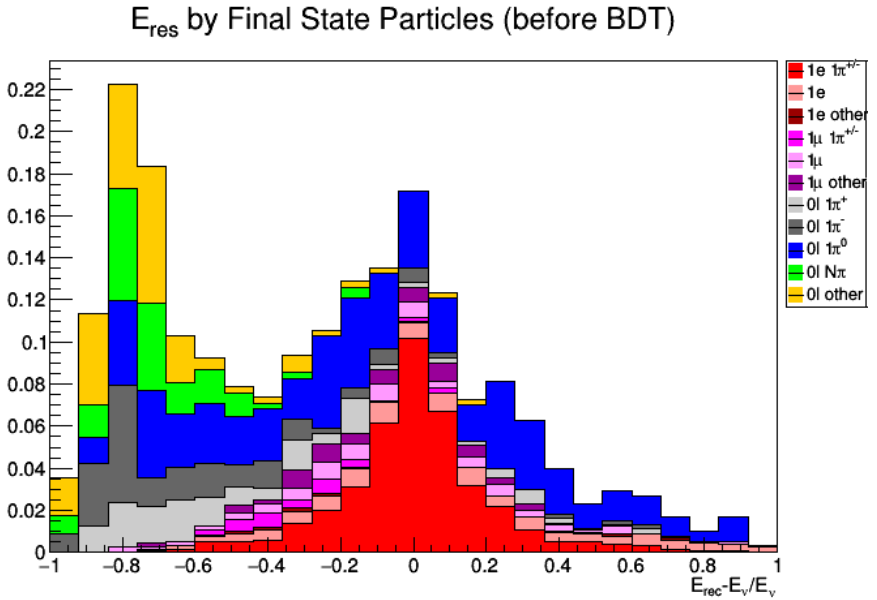


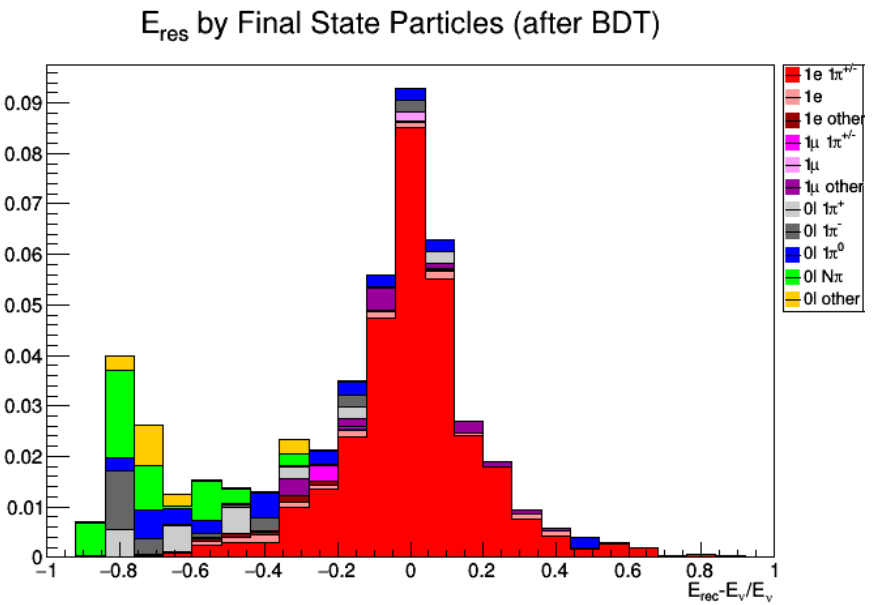




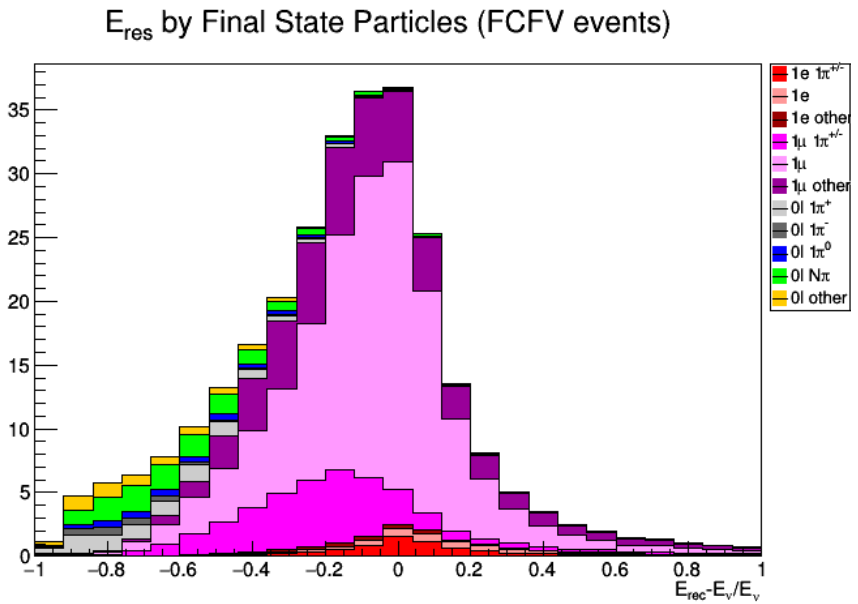
Stacked E_{res} (0de)

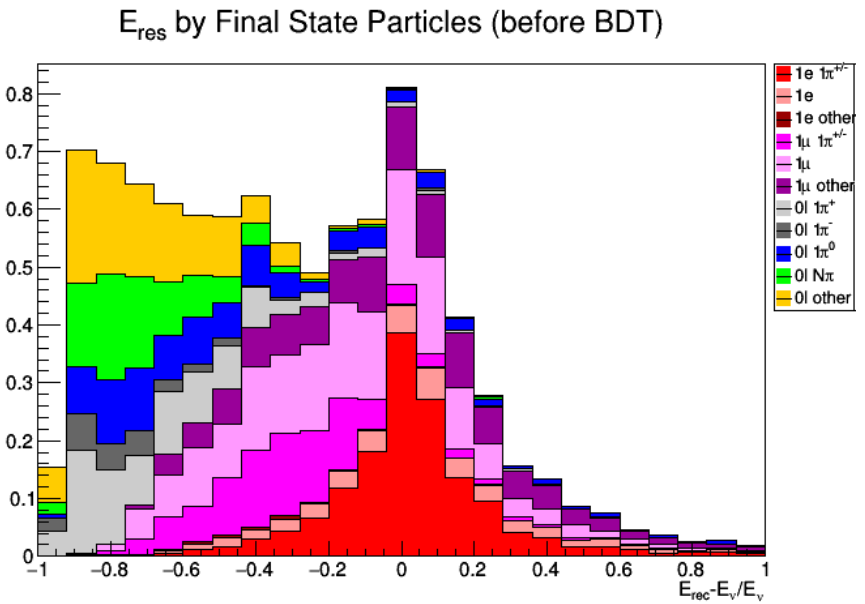


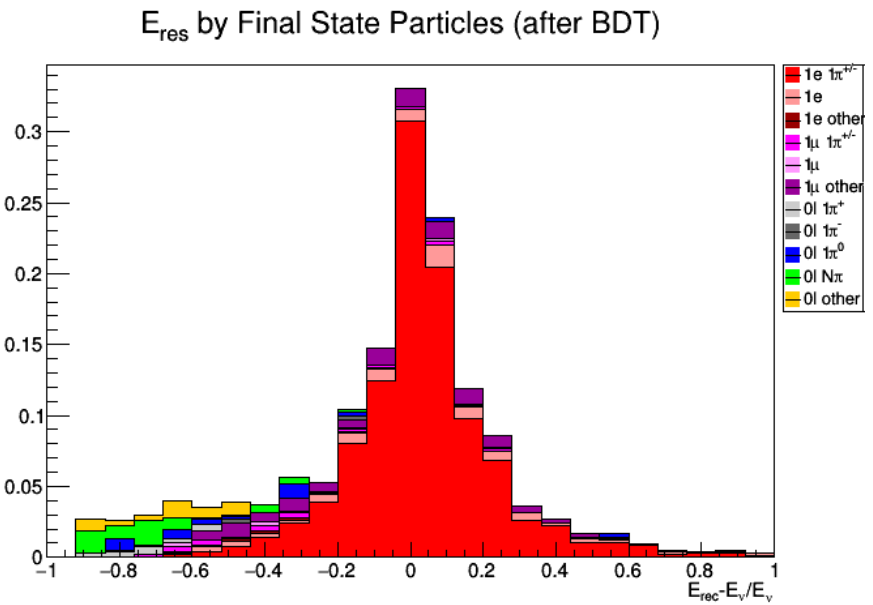




Stacked E_{res} (1de)

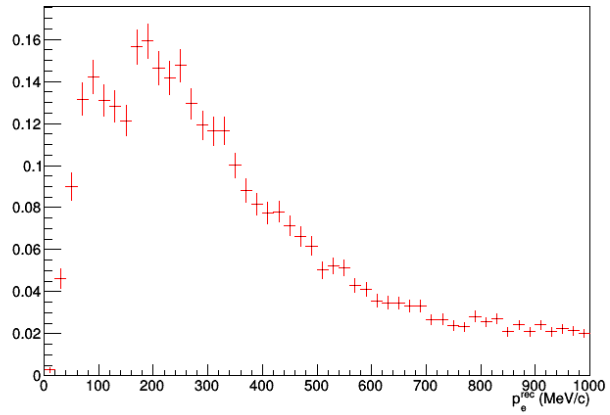


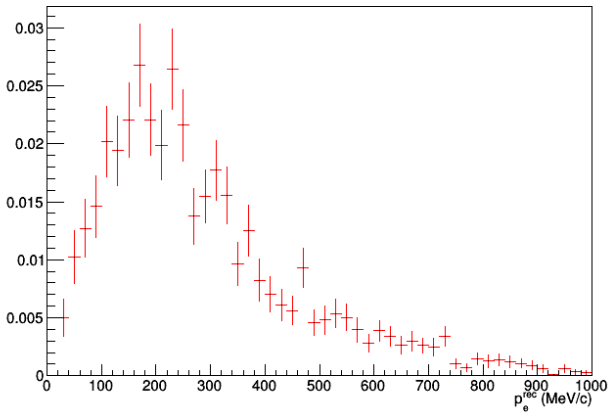


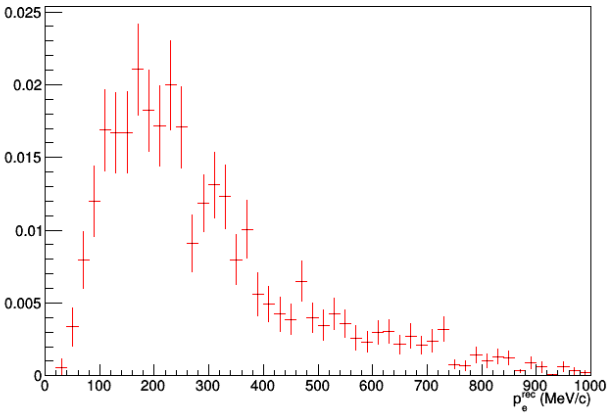


Signal p_e^{rec}

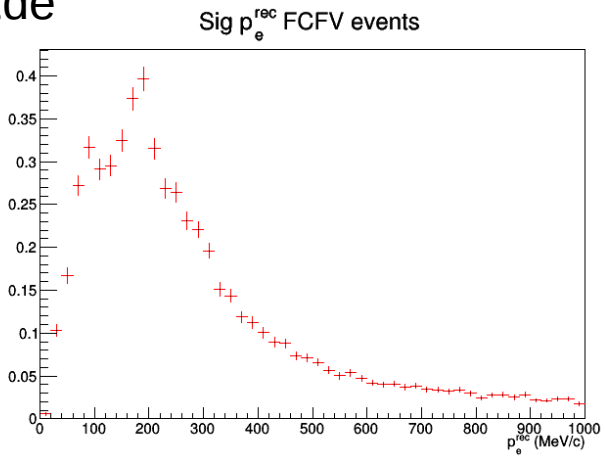
0de

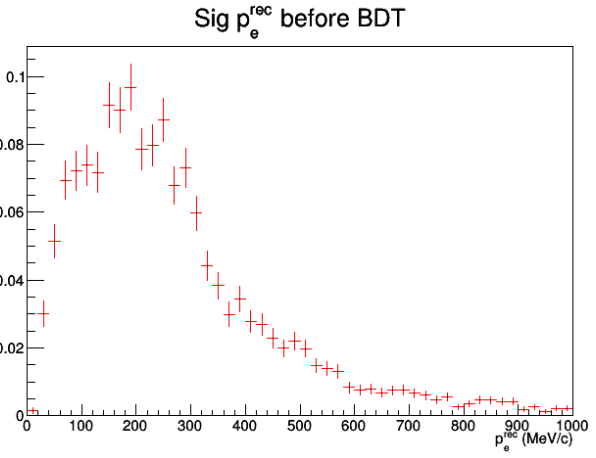


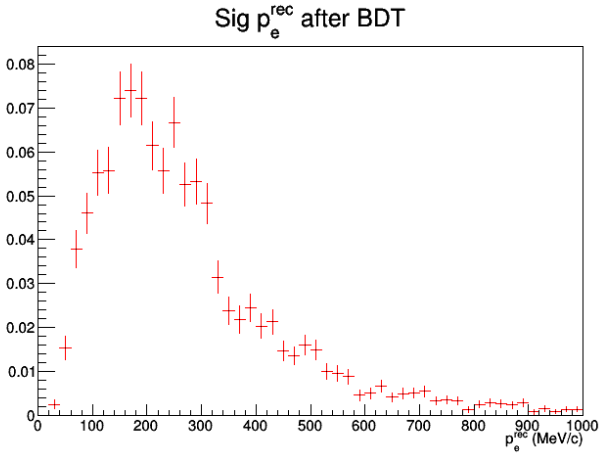




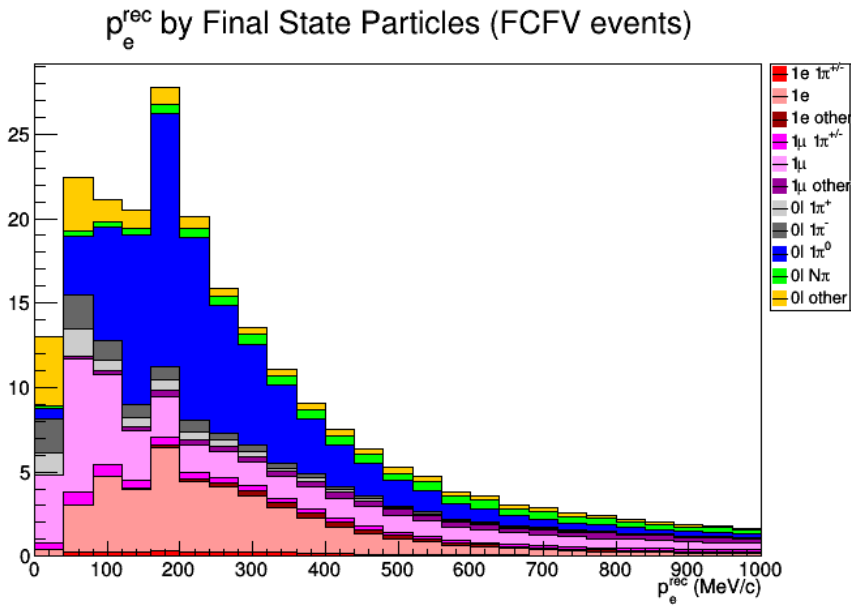
1de

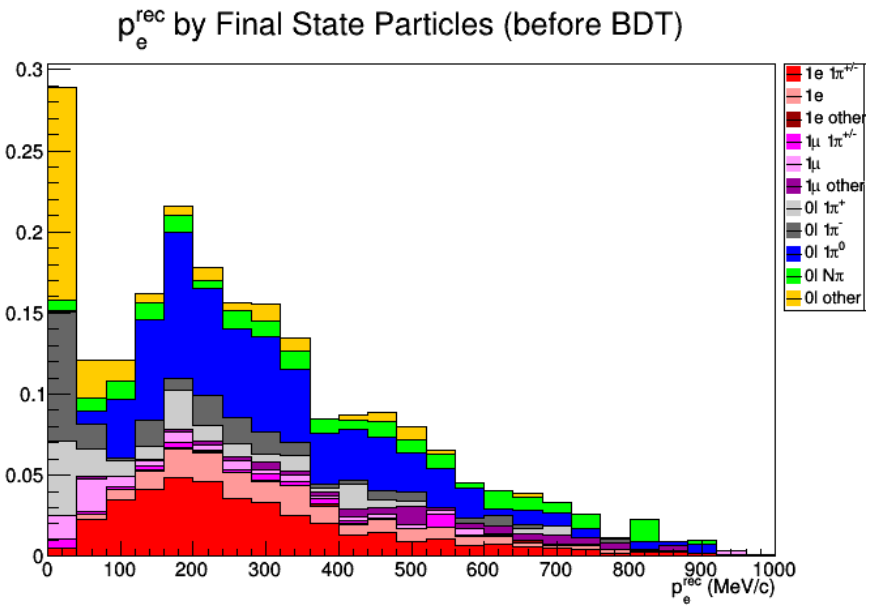


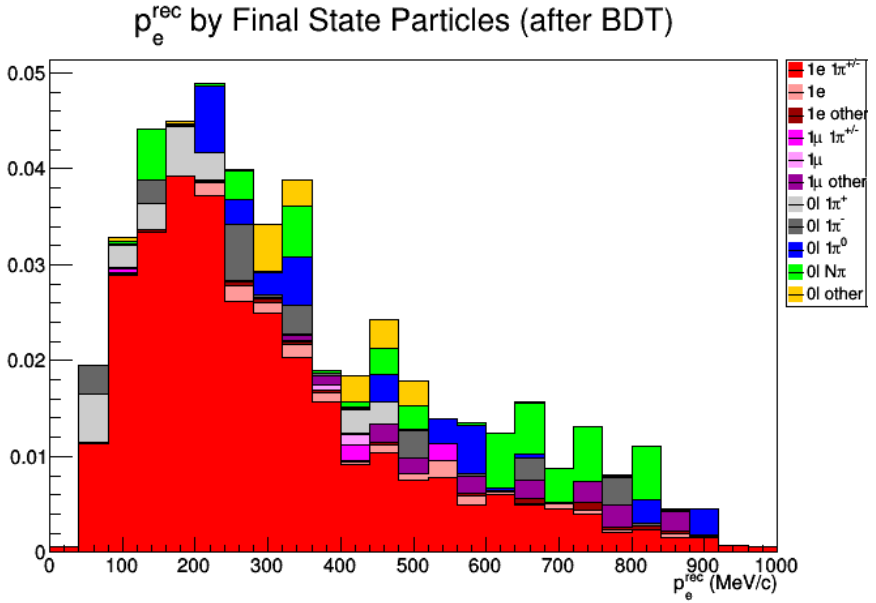




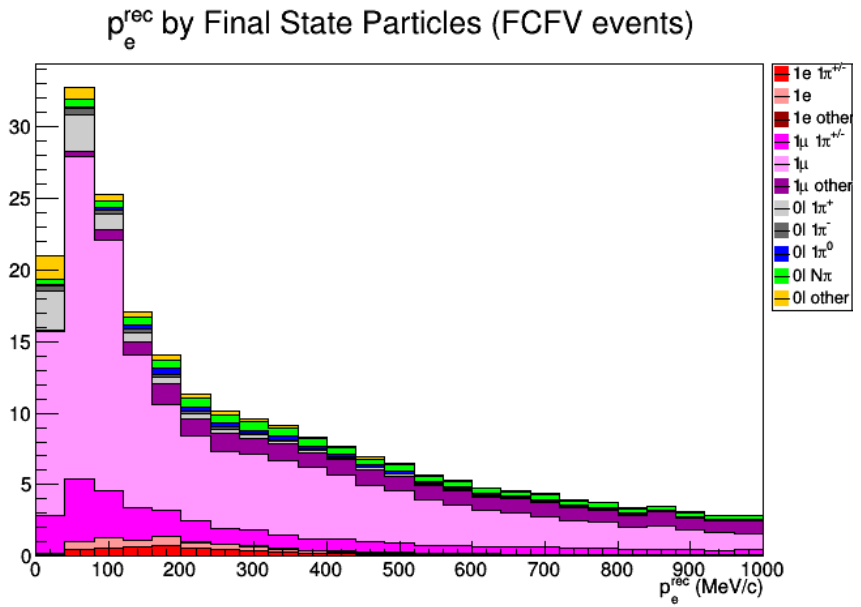
Stacked p_e^{rec} (0de)

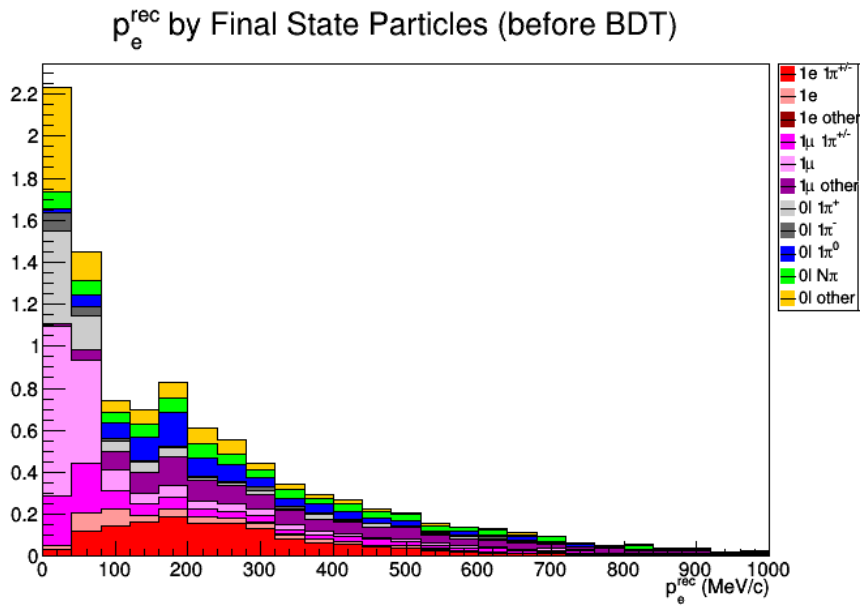


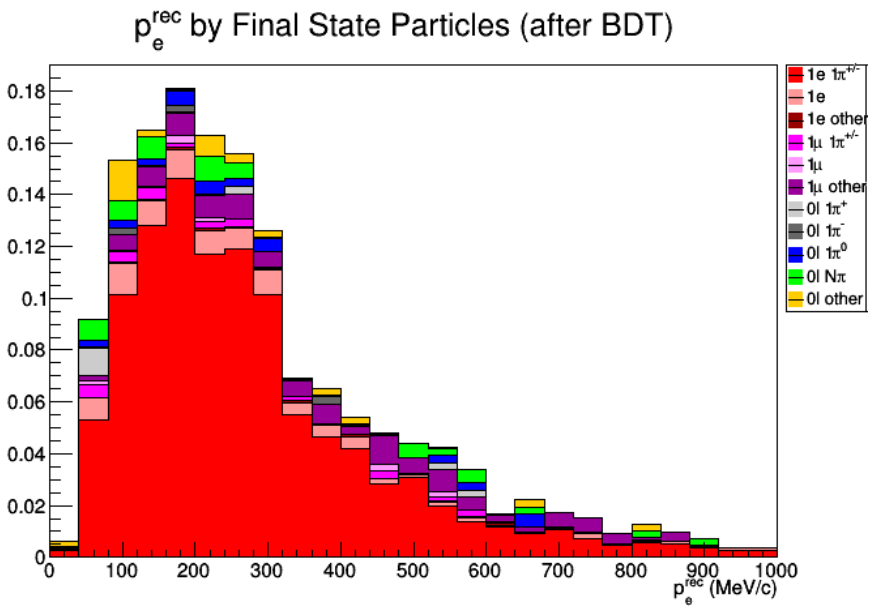




Stacked p_e^{rec} (1de)

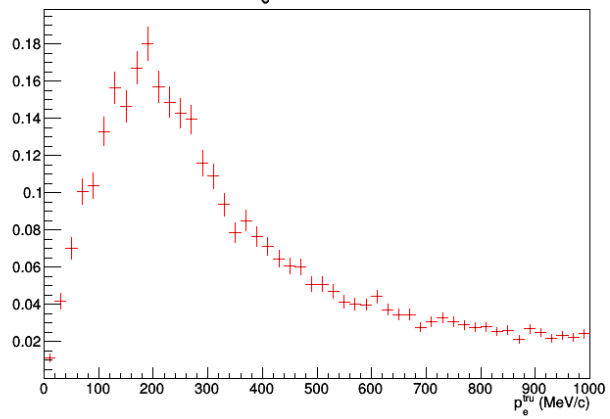


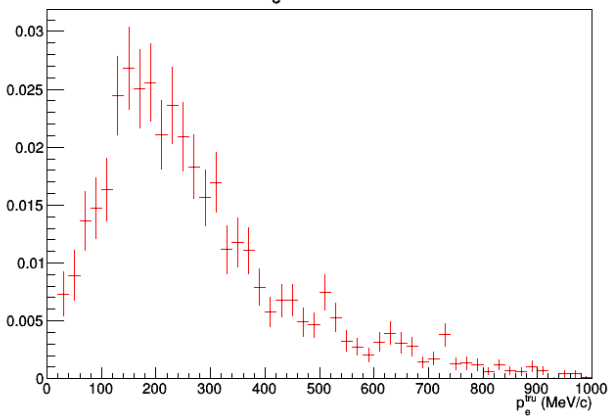


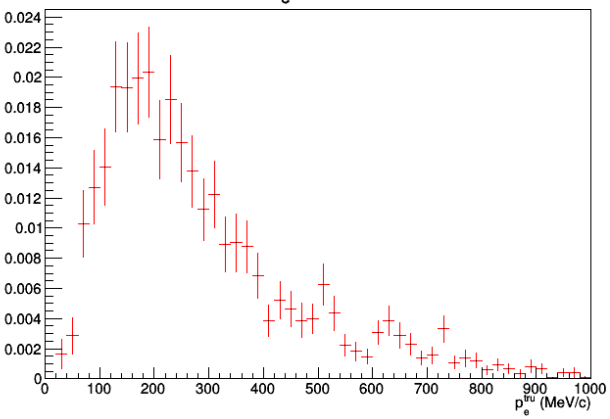


Signal p_e^{tru}

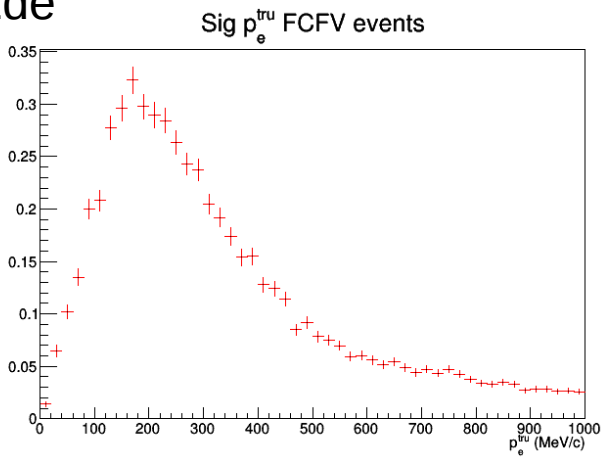
0de

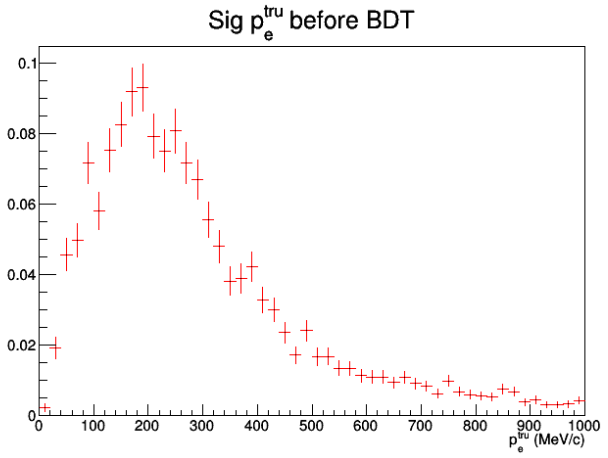


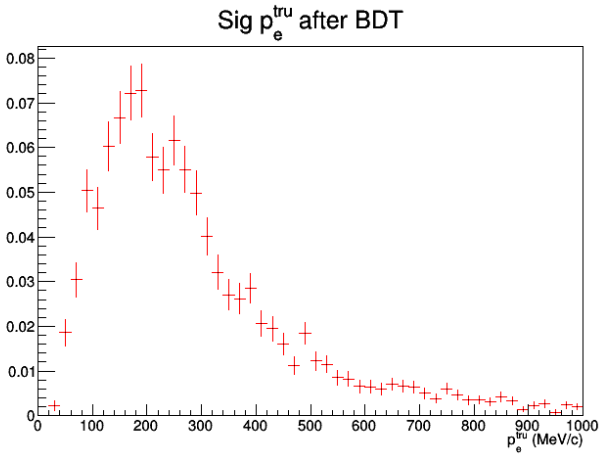




1de

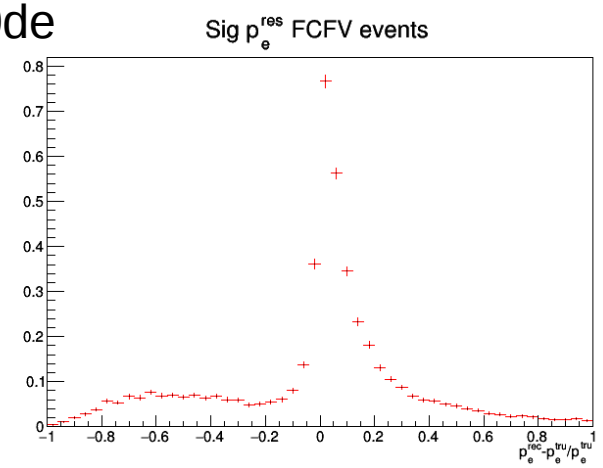


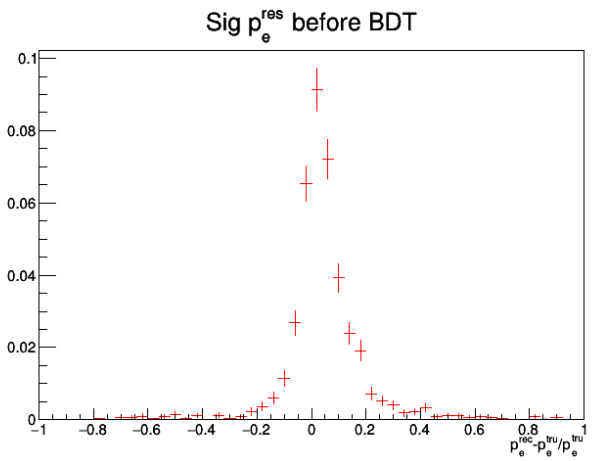


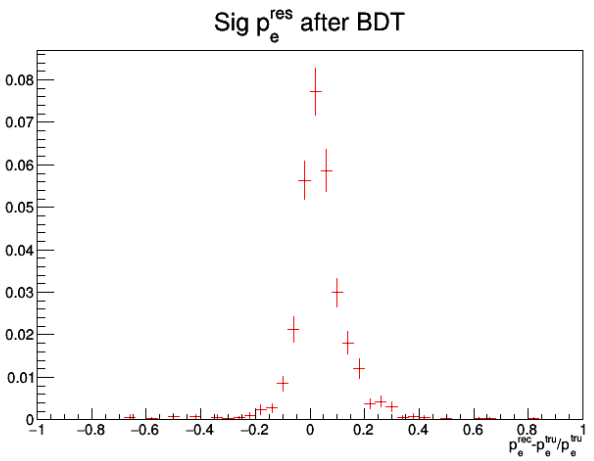


Signal p_e^{res}

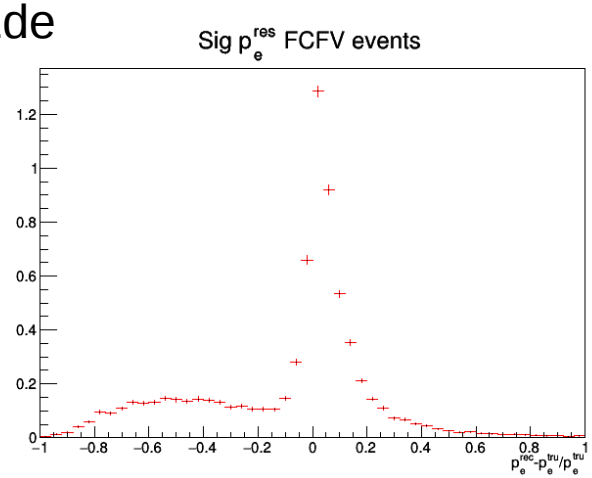
0de

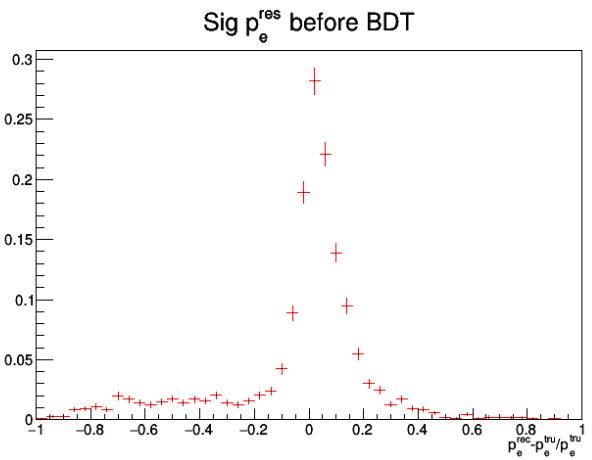


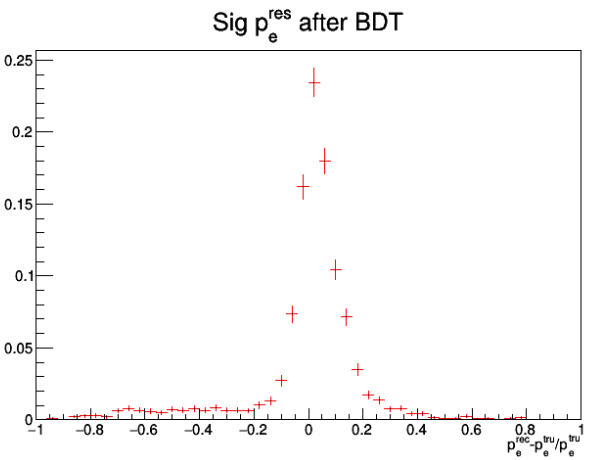




1de

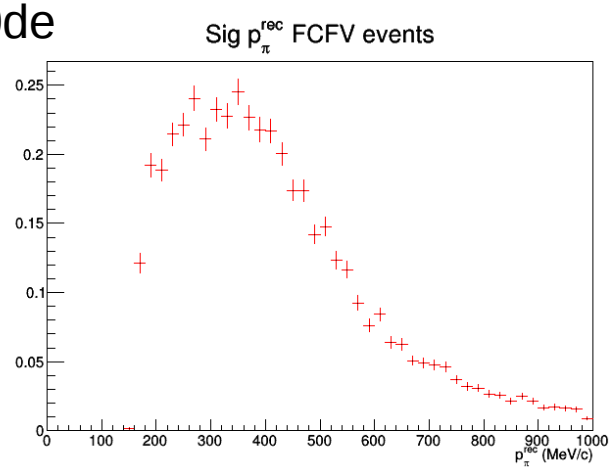


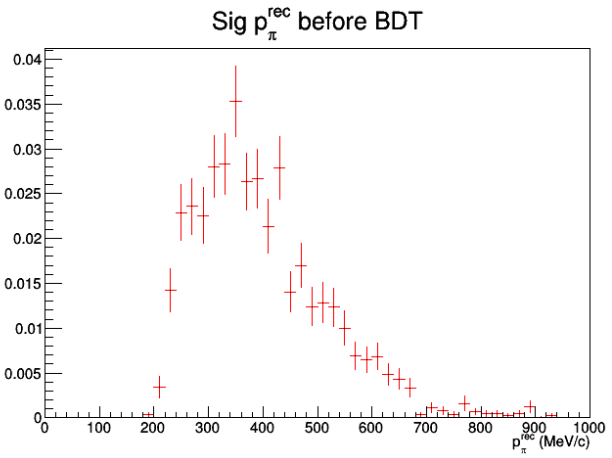


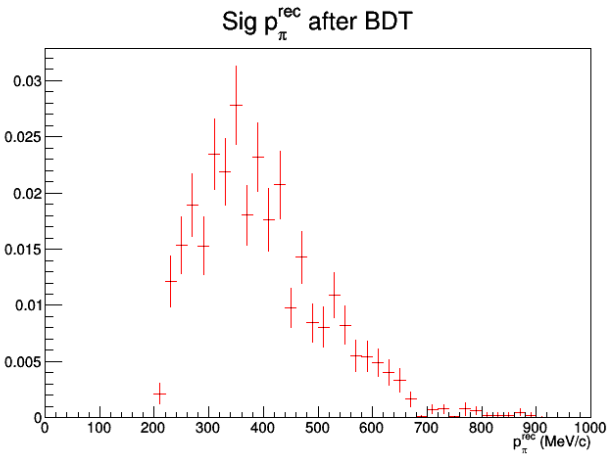


Signal p_π^{rec}

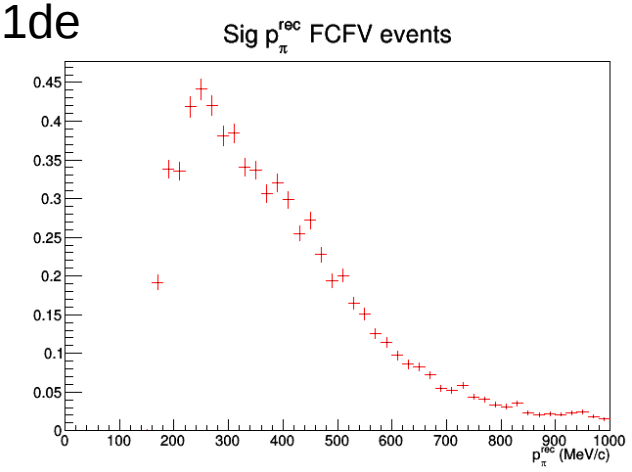
0de

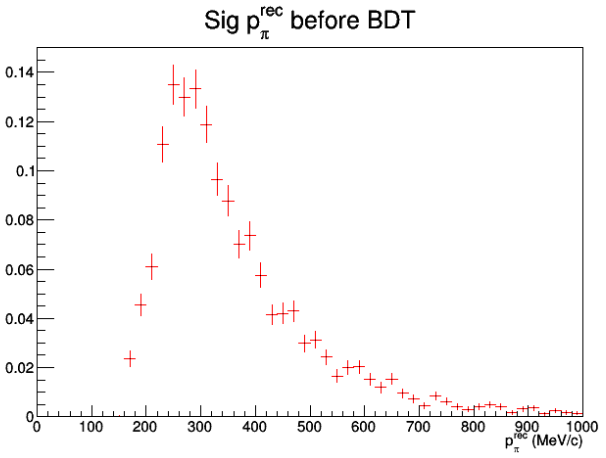


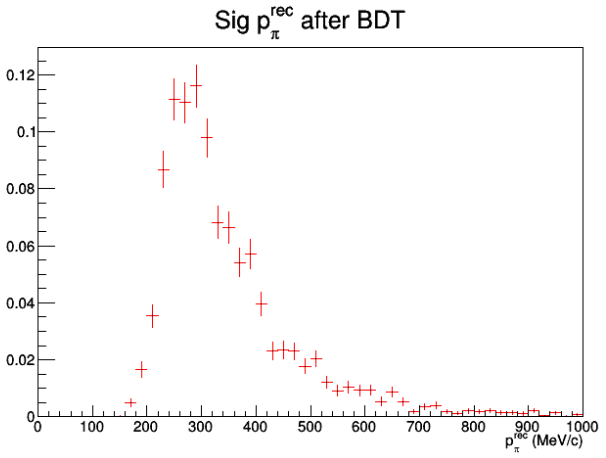




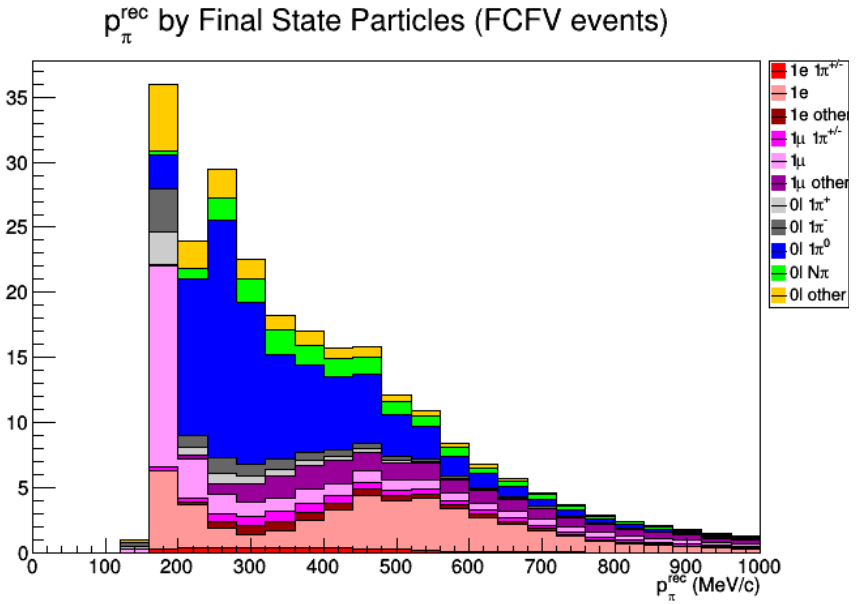
1de

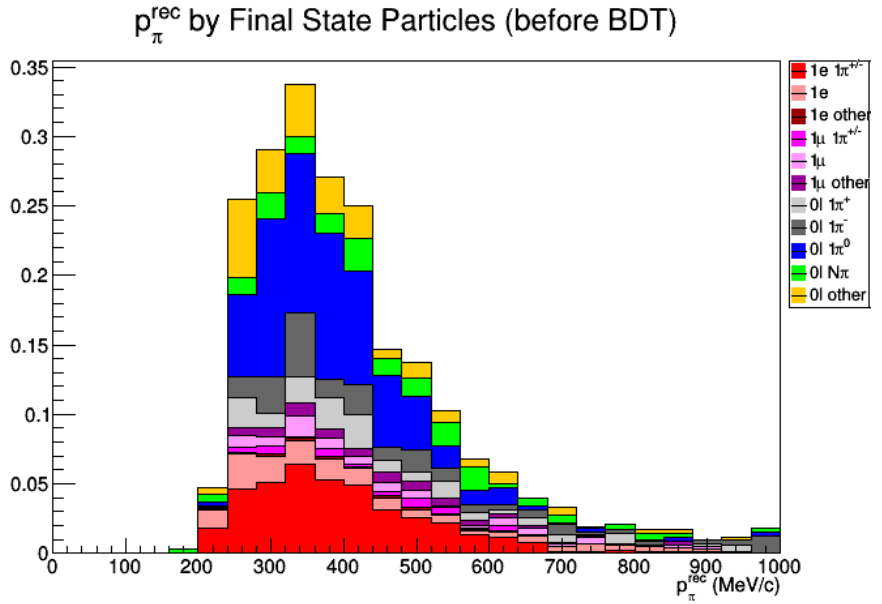


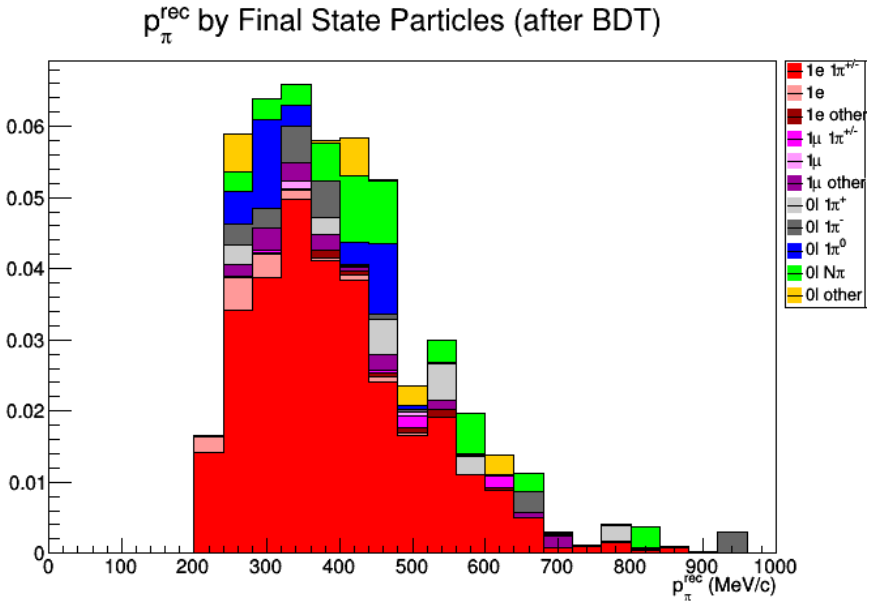




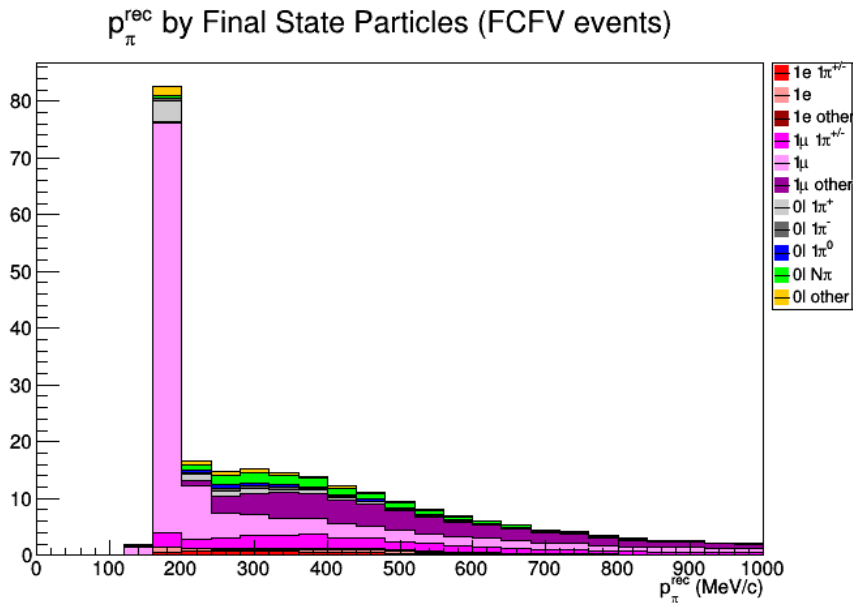
Stacked p_π^{rec} (0de)

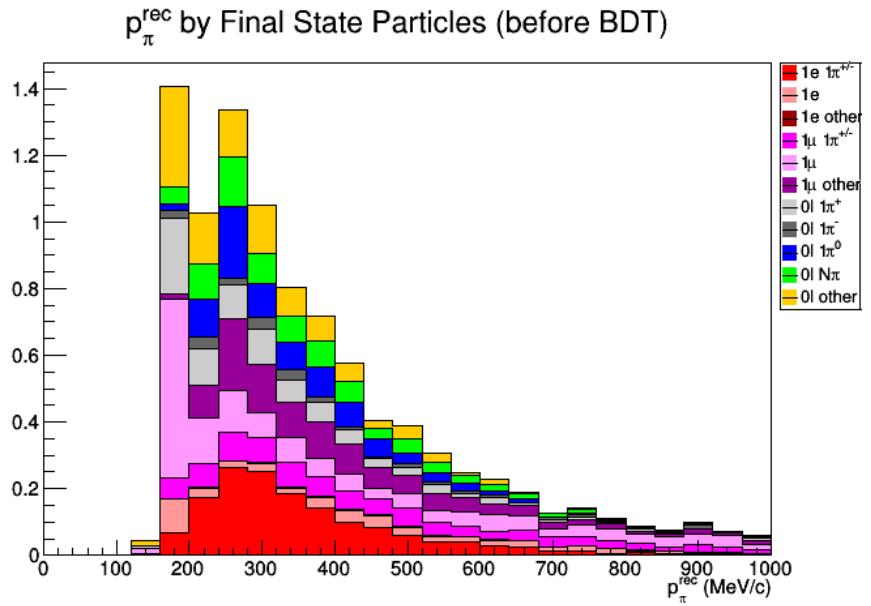


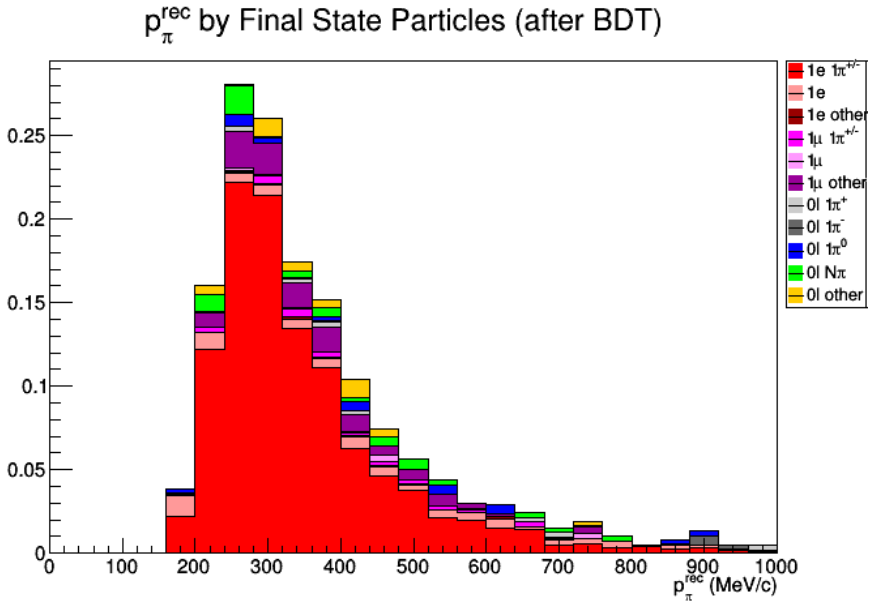




Stacked p_{π}^{rec} (1de)

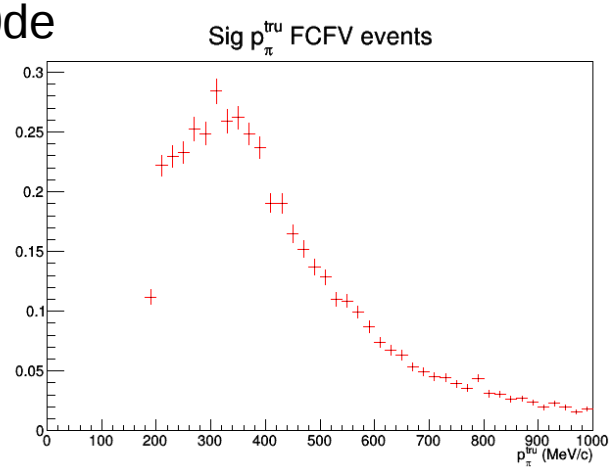


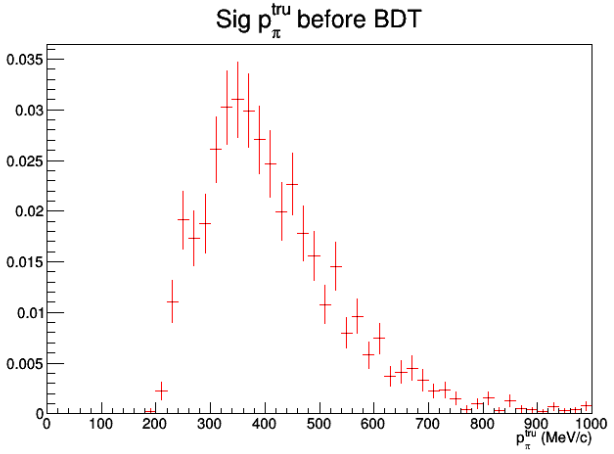


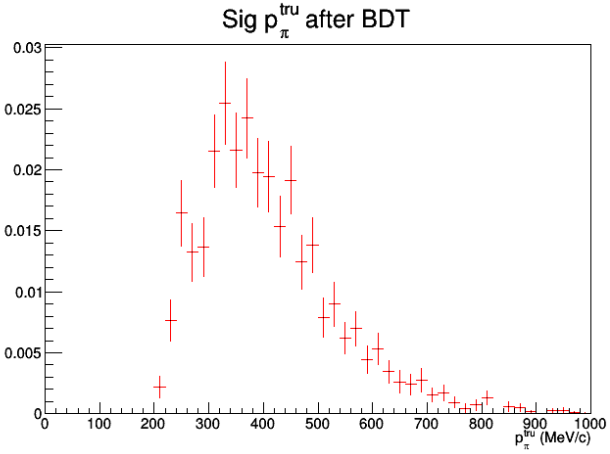


Signal p_{π}^{tru}

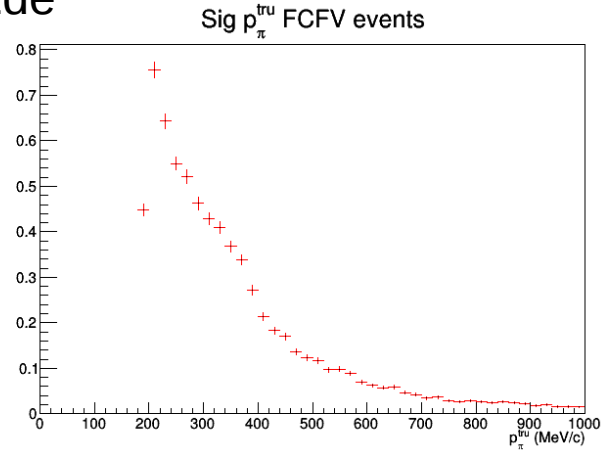
0de

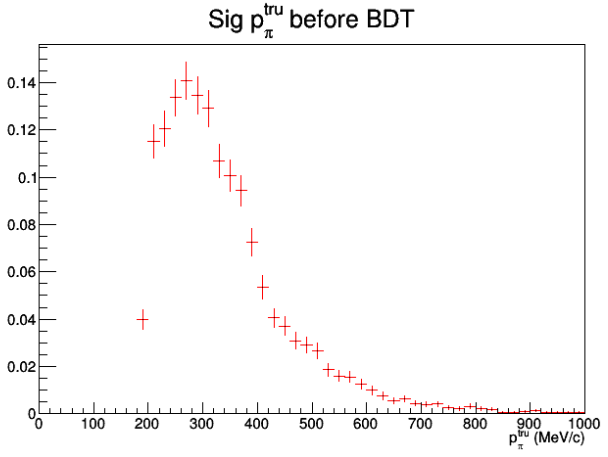


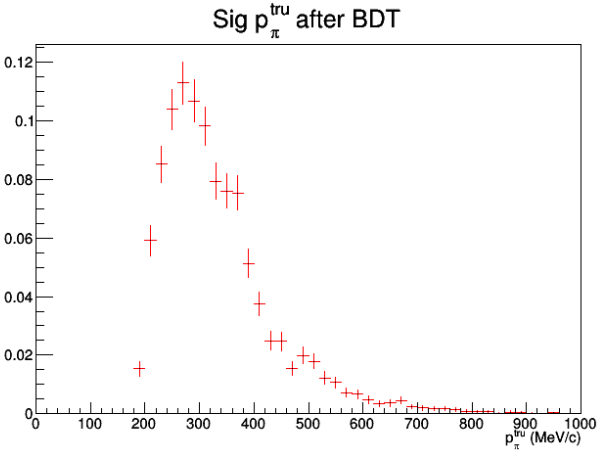




1de

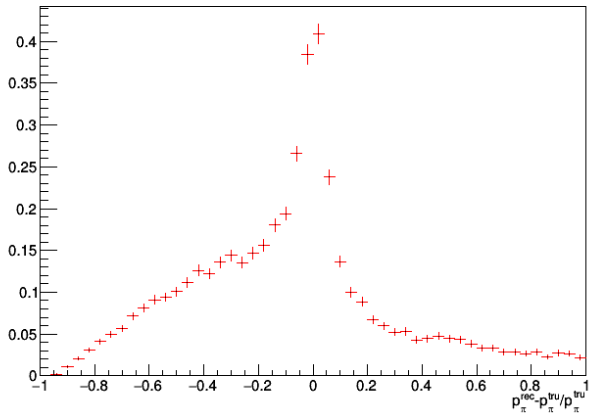


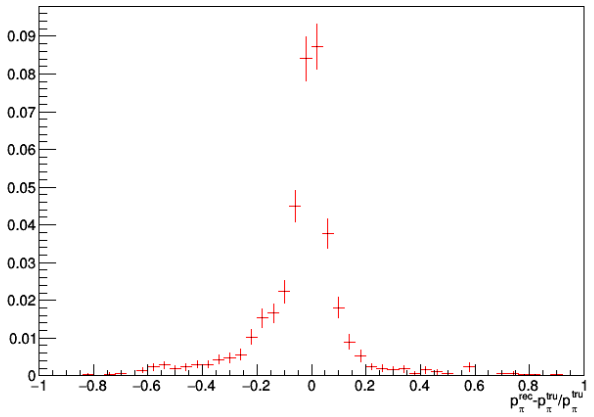


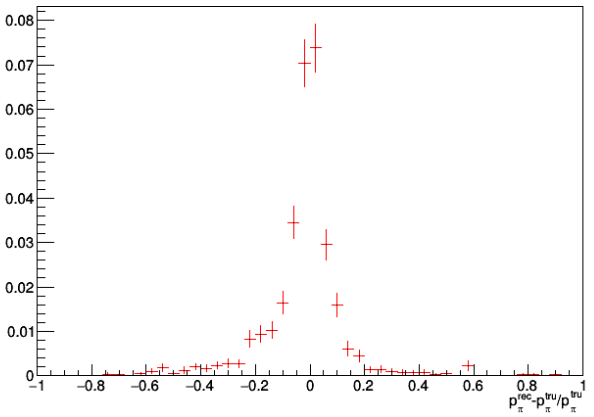


Signal p_π^{res}

0de







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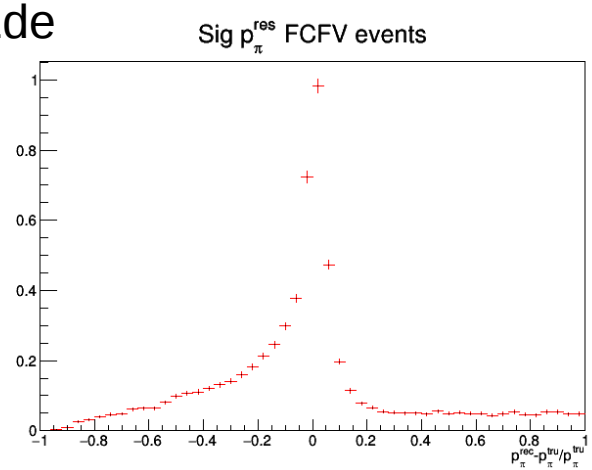
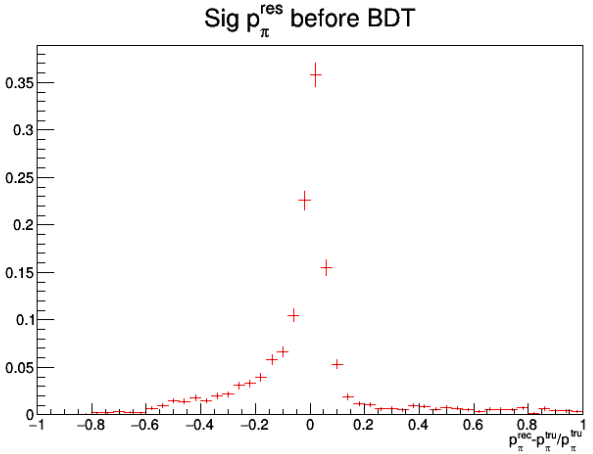
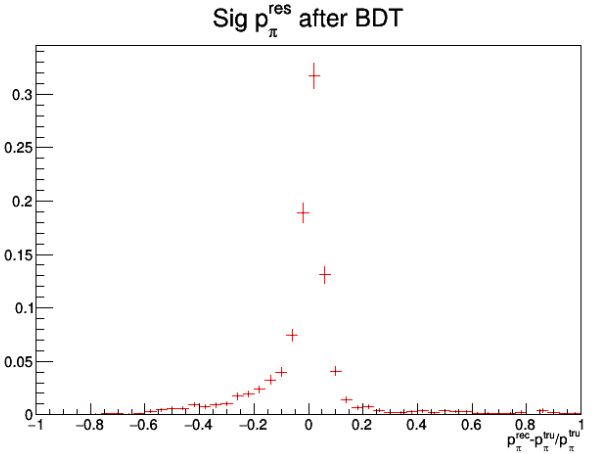
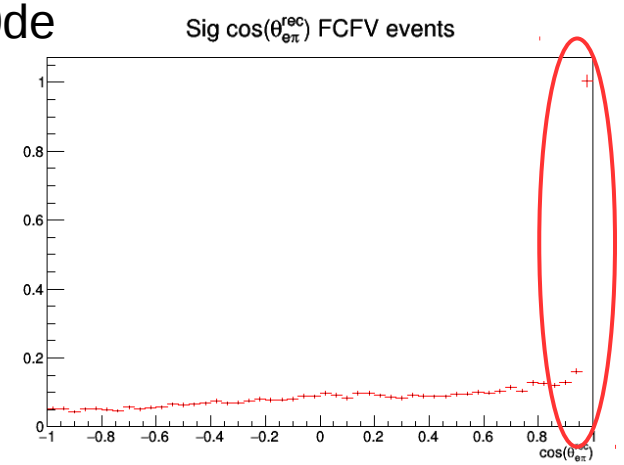


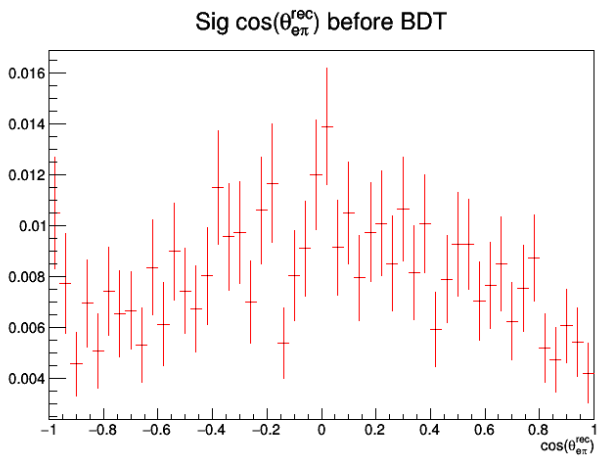


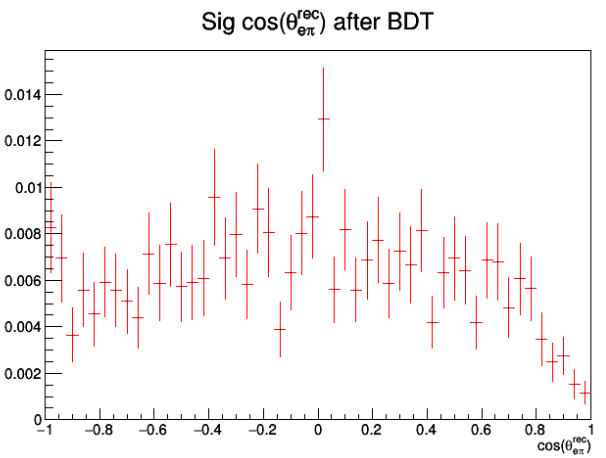


Signal $\cos(\theta_{e\pi}^{rec})$

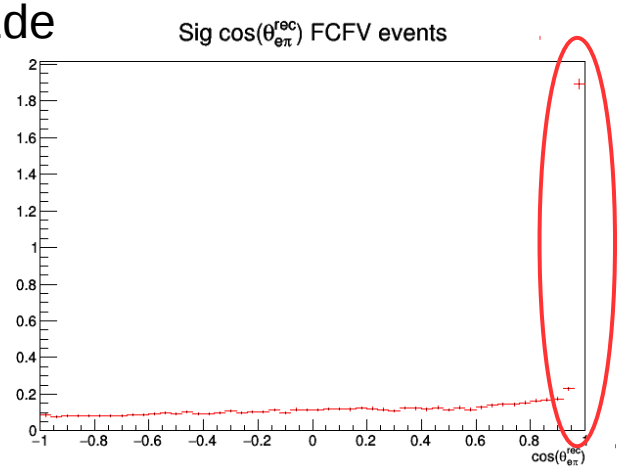
0de

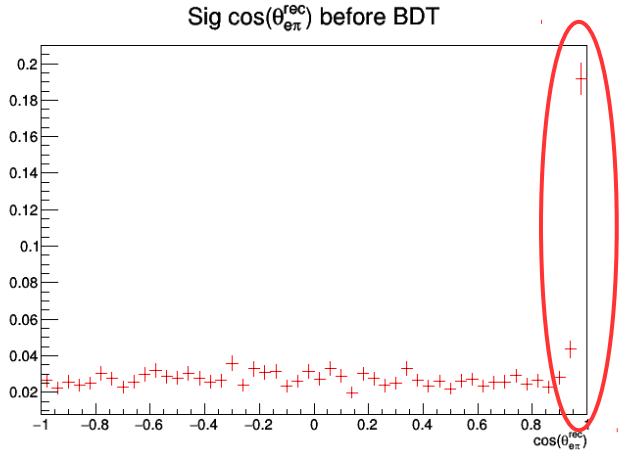


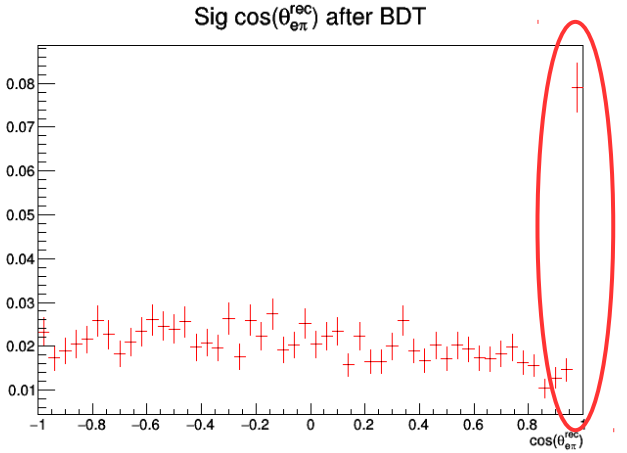




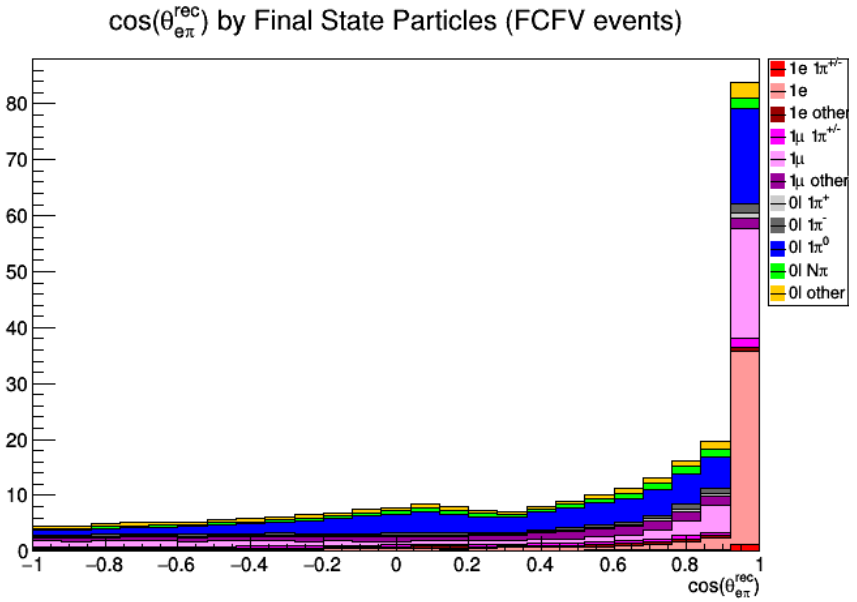
1de

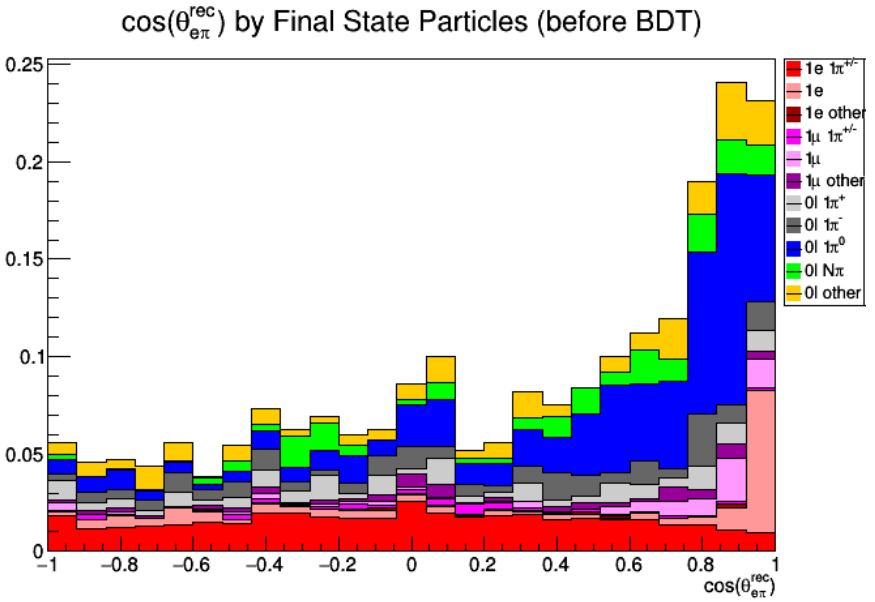


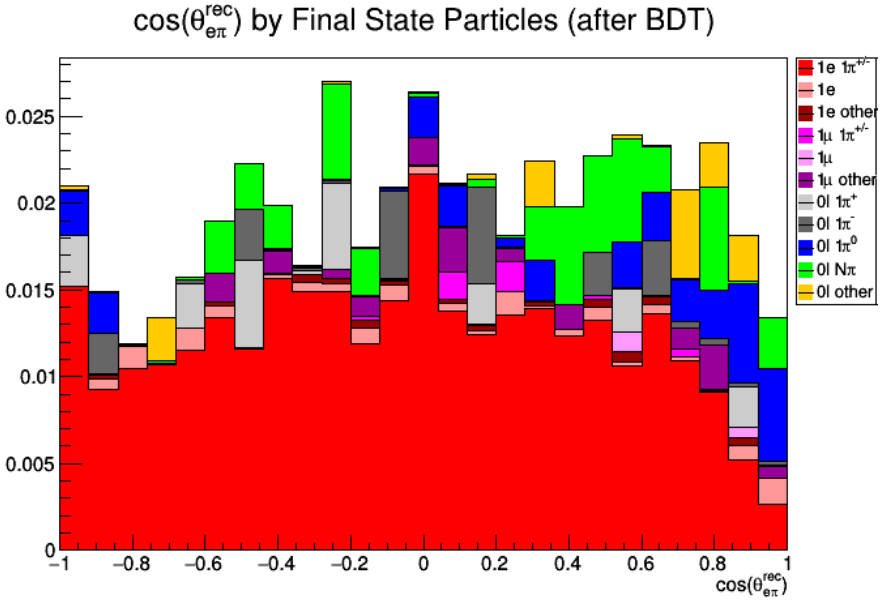




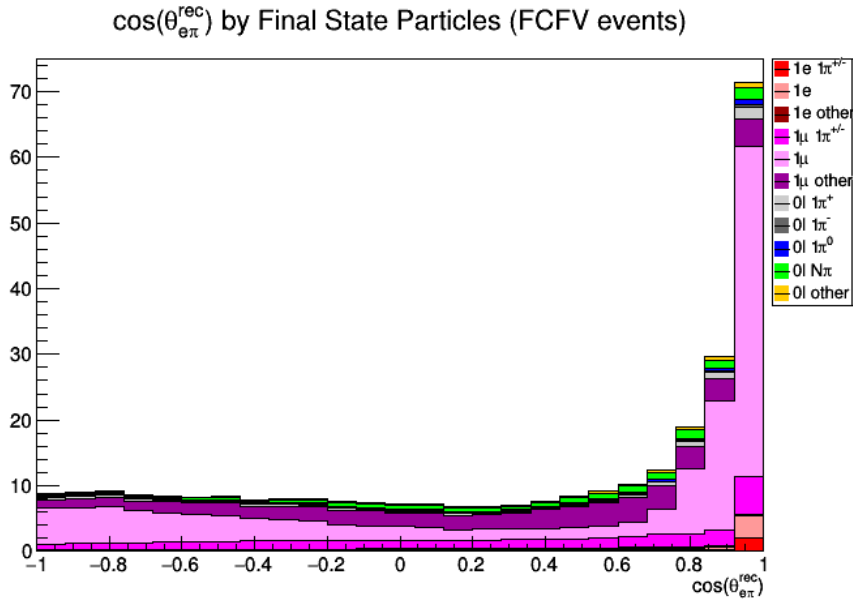
Stacked $\cos(\theta_{e\pi}^{rec})$ (0de)

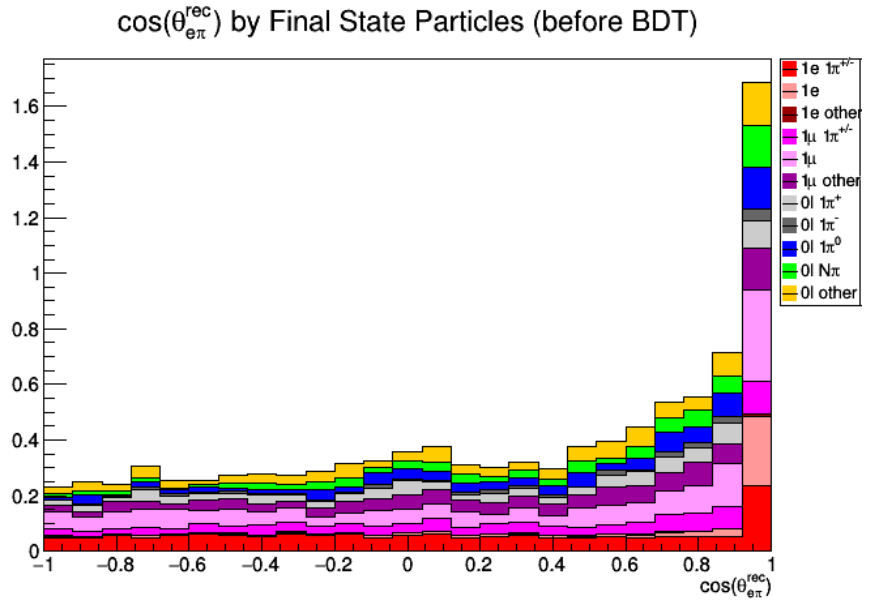


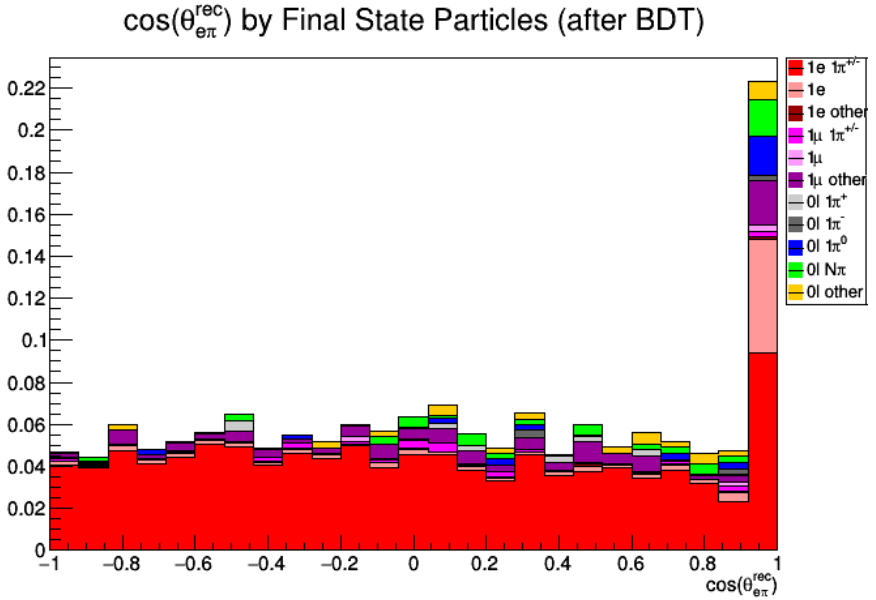




Stacked $\cos(\theta_{e\pi}^{rec})$ (1de)

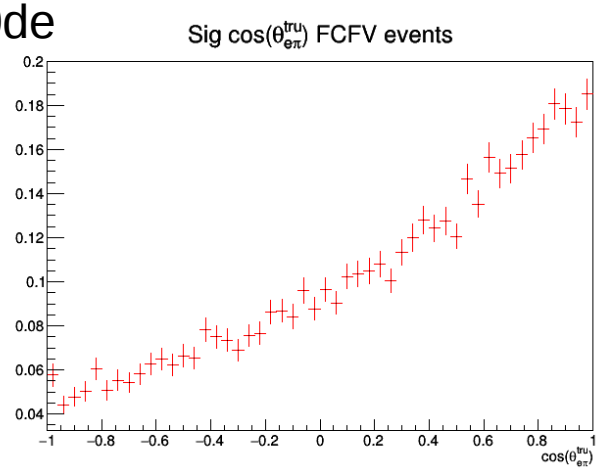


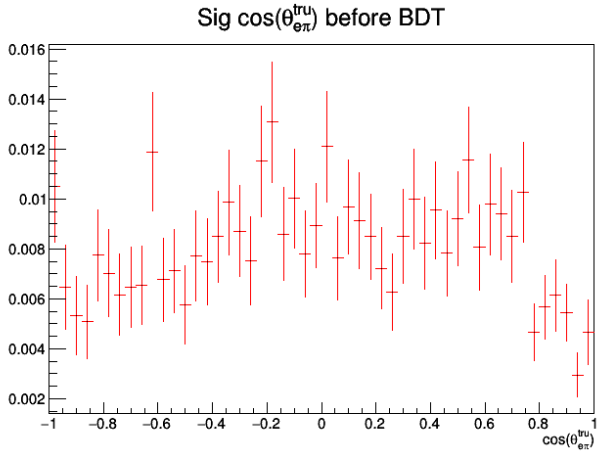


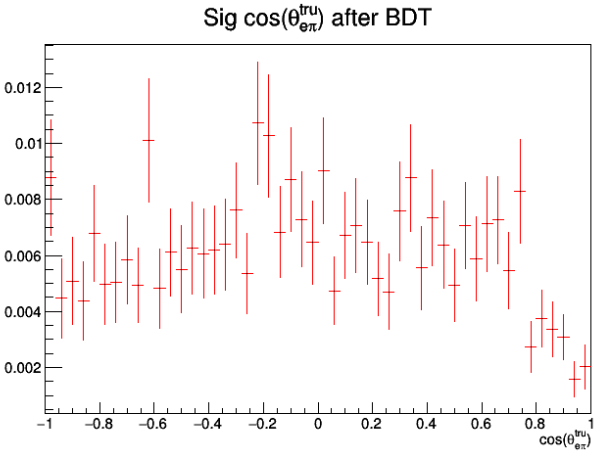


Signal $\cos(\theta_{e\pi}^{tru})$

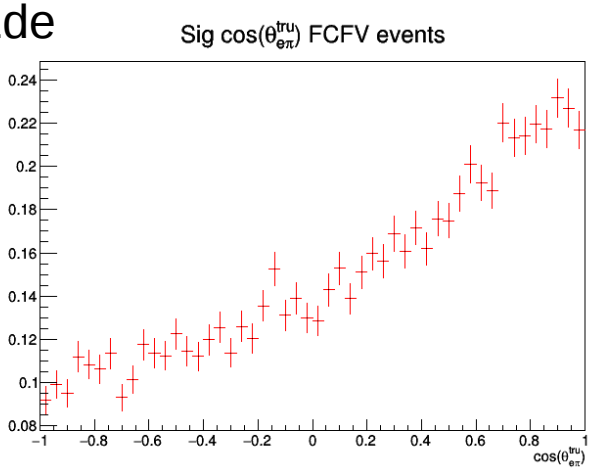
0de

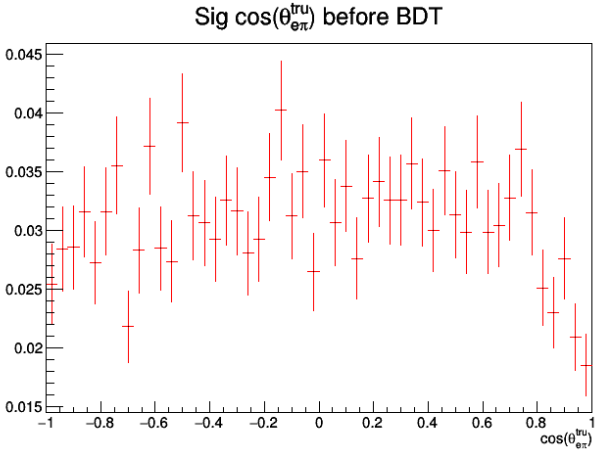


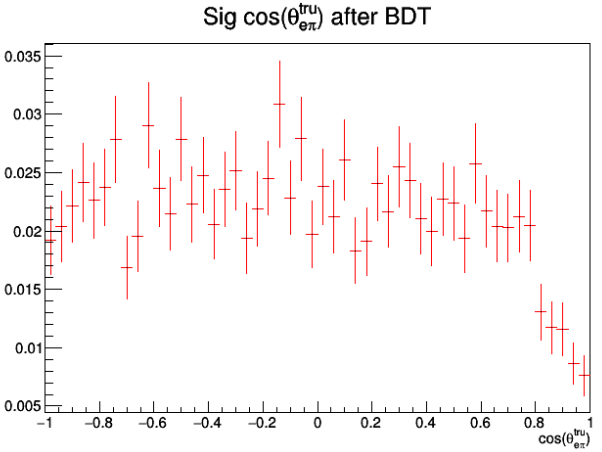




1de

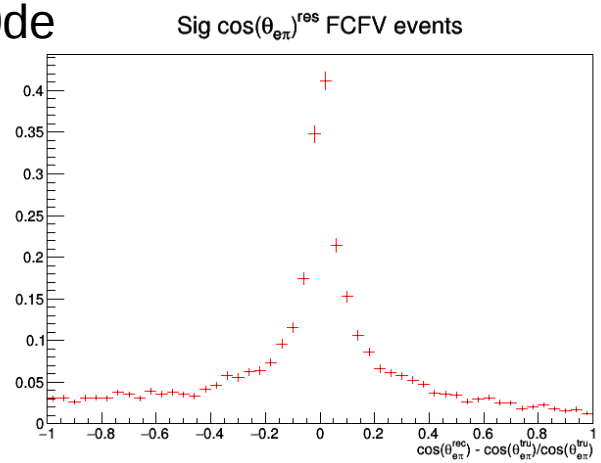


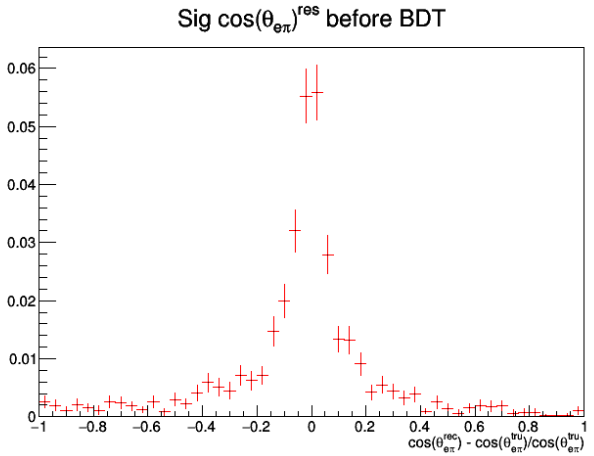


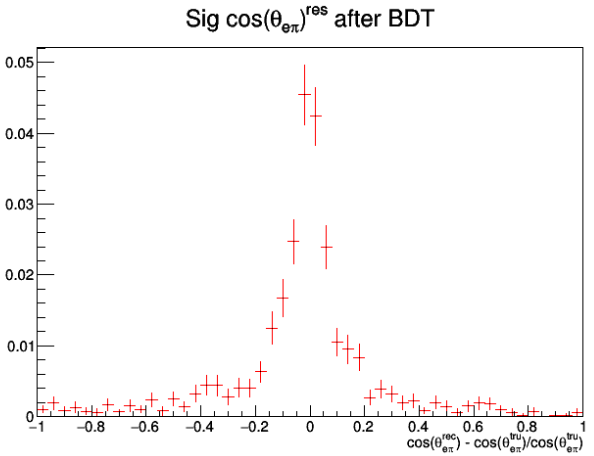


Signal $\cos(\theta_{e\pi})^{res}$

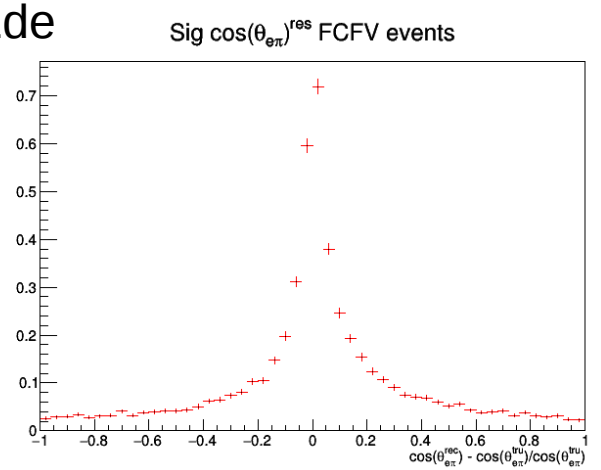
0de

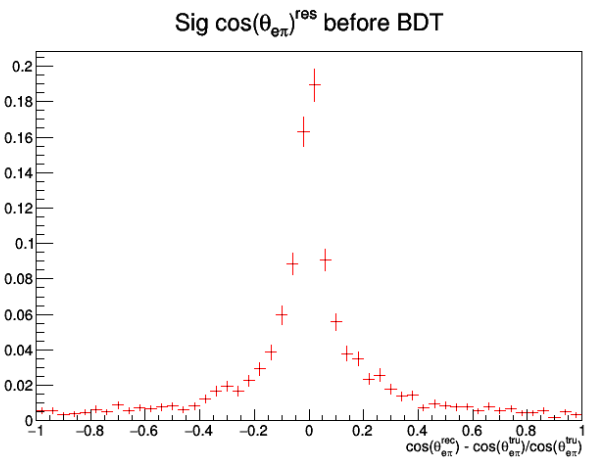


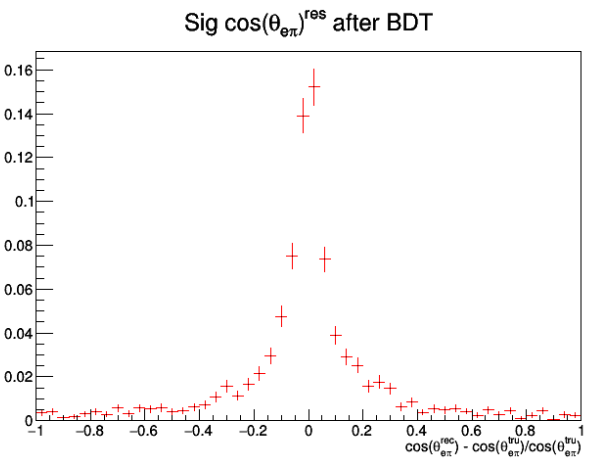




1de





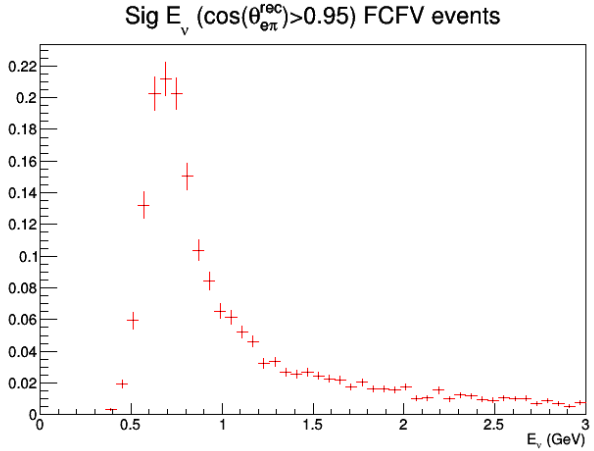


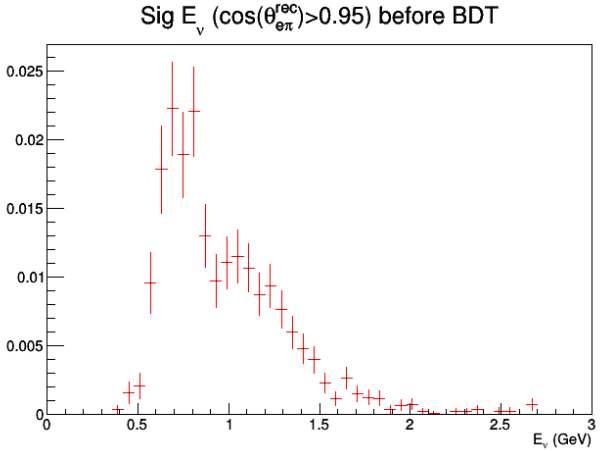
A closer look at $\cos(\theta_{e\pi}^{rec})>0.95$

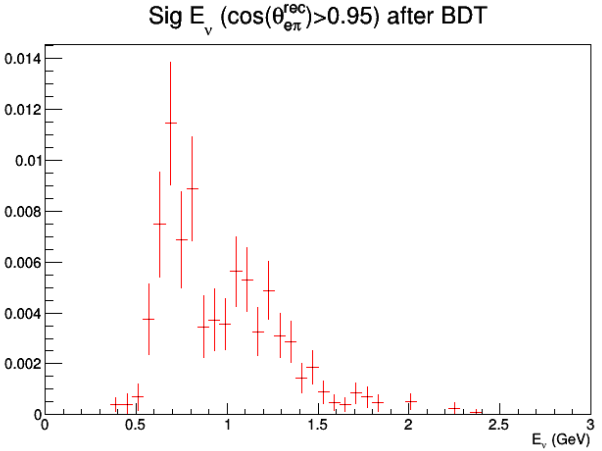
- For cos()>0.95, plot the signal:
  - E_{ν}, E_{res}
  - p_e^{tru}, p_e^{res}
  - p_{π}^{tru}, p_{π}^{res}
  - $\cos(\theta_{e\pi})^{res}$
- Only 1de plots are shown (0de plots are available)

Signal E_ν (1de)

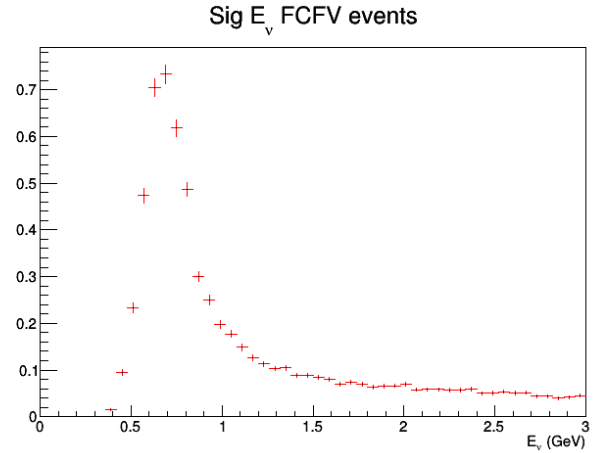
$\cos(\theta_{e\pi}^{rec})>0.95$

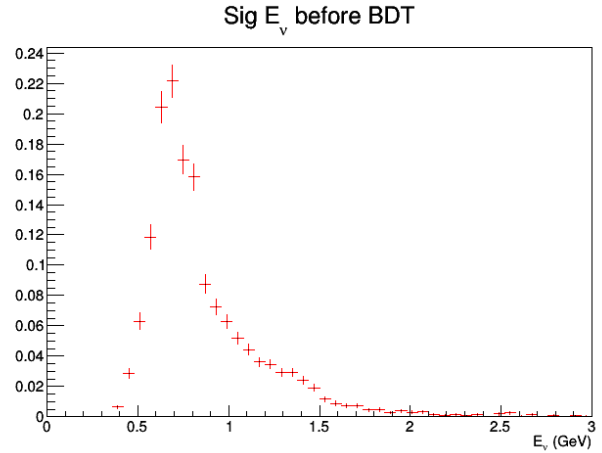


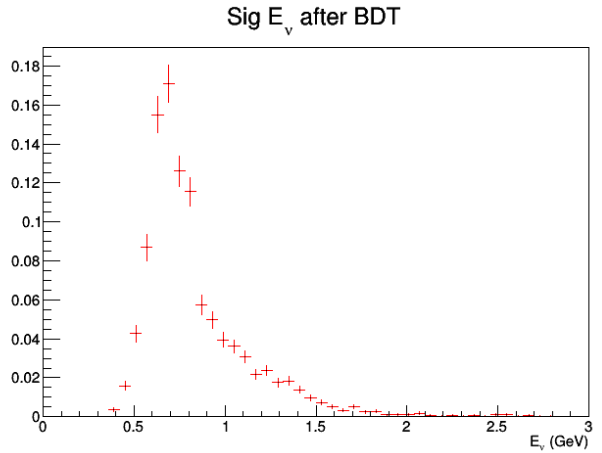




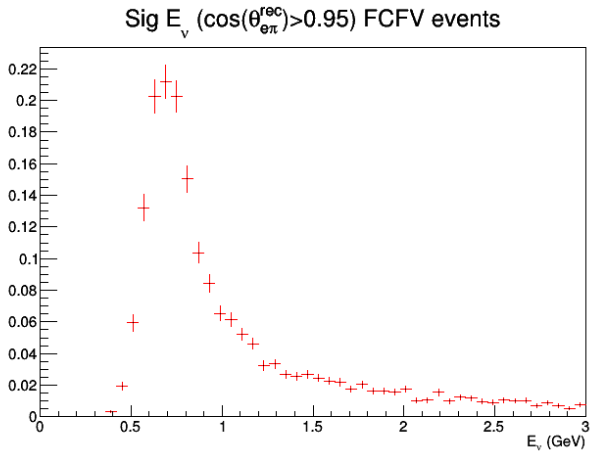
all events

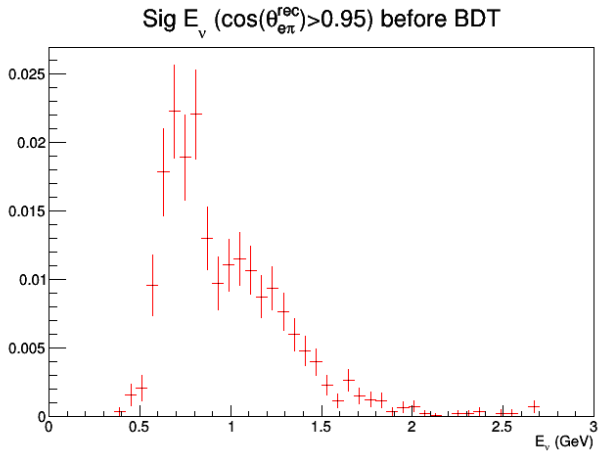


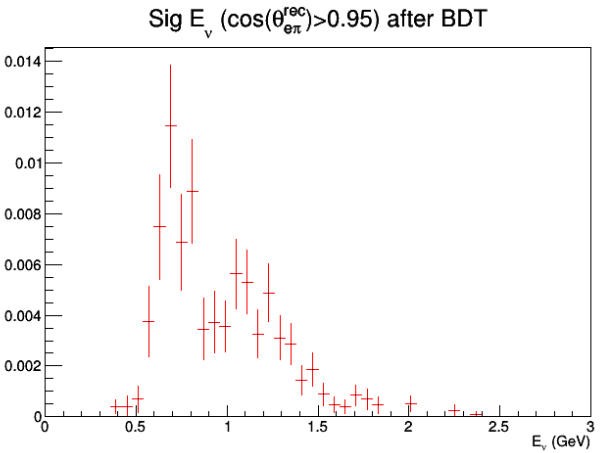


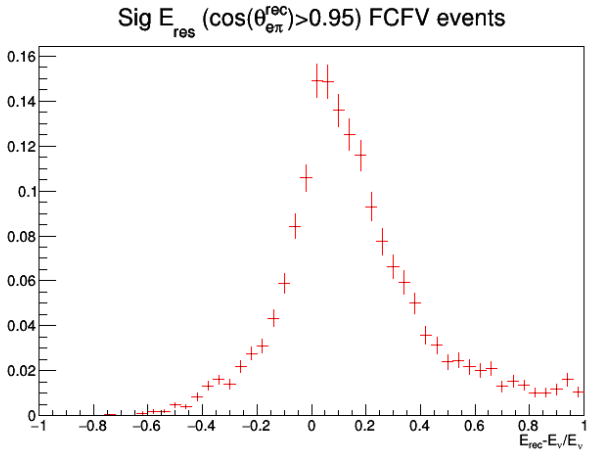


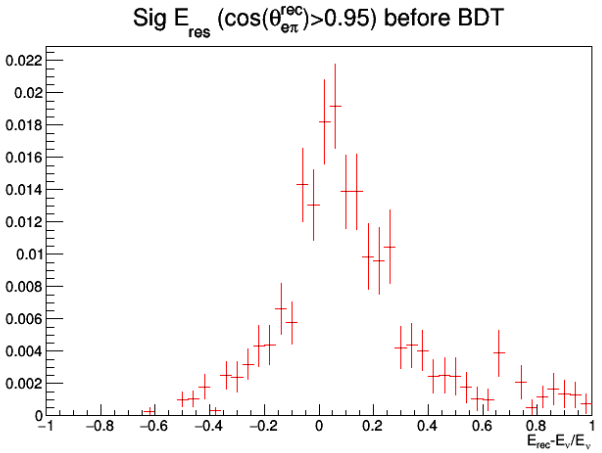
Signal E_ν, E_{res} (1de)

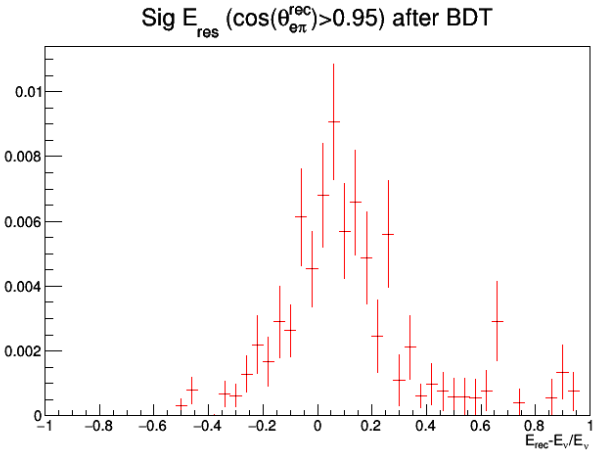






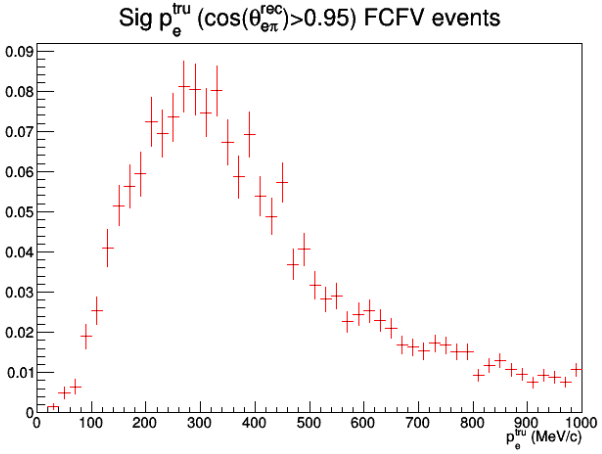


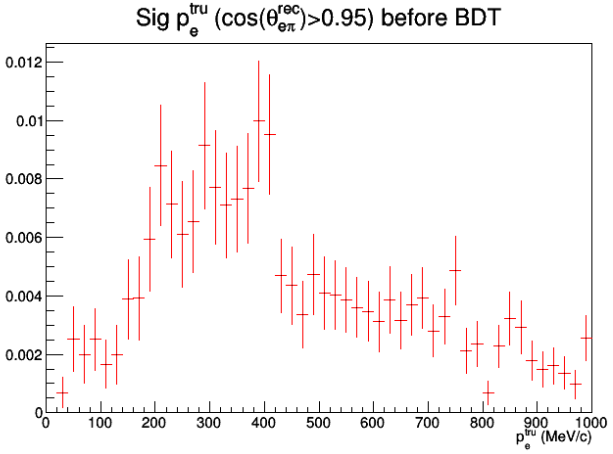


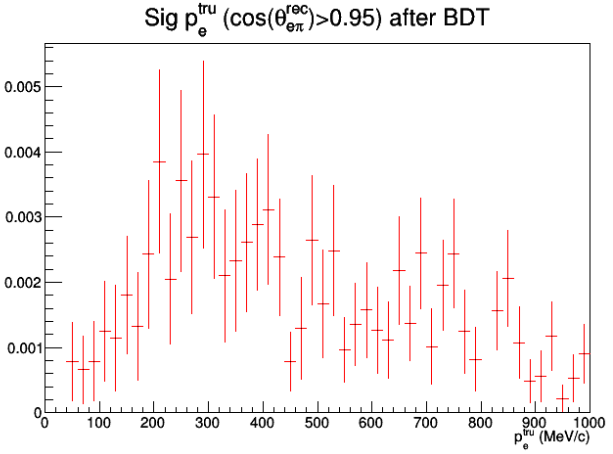


Signal p_e^{tru} (1de)

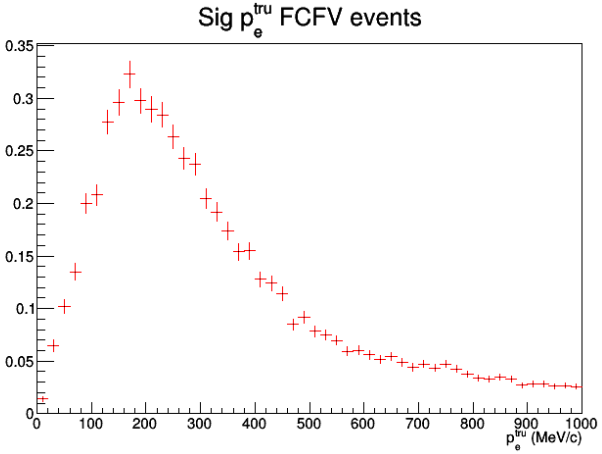
$\cos(\theta_{e\pi}^{rec})>0.95$

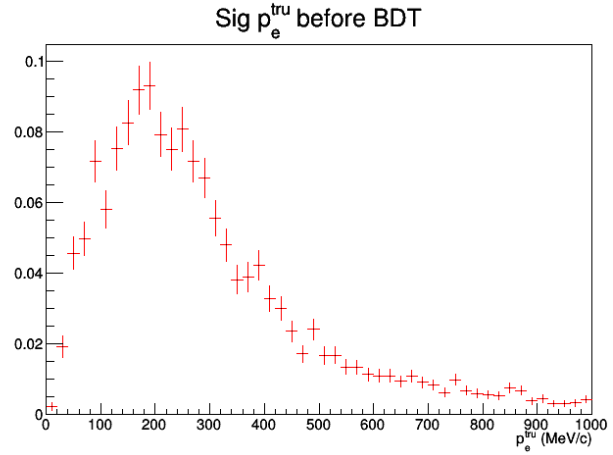


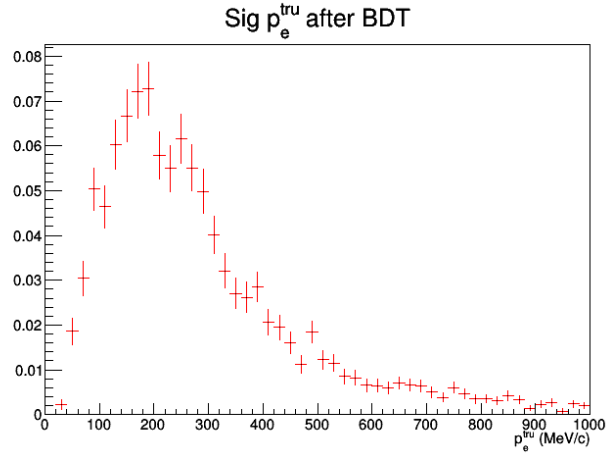




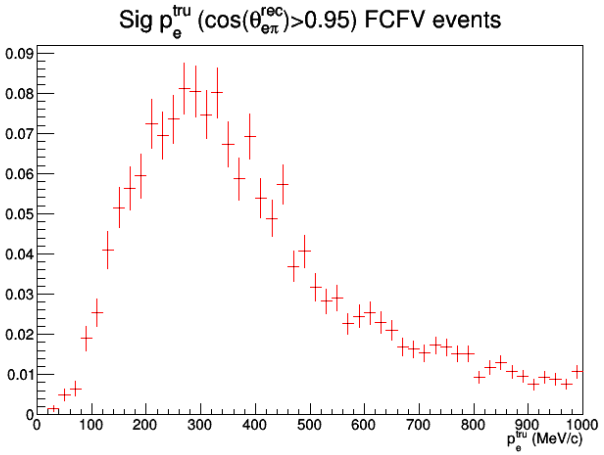
all events

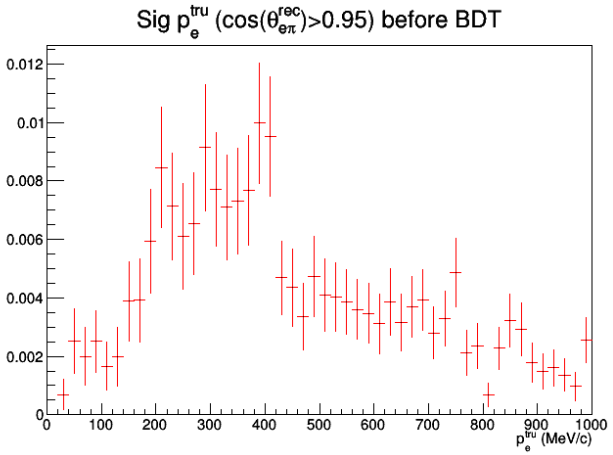


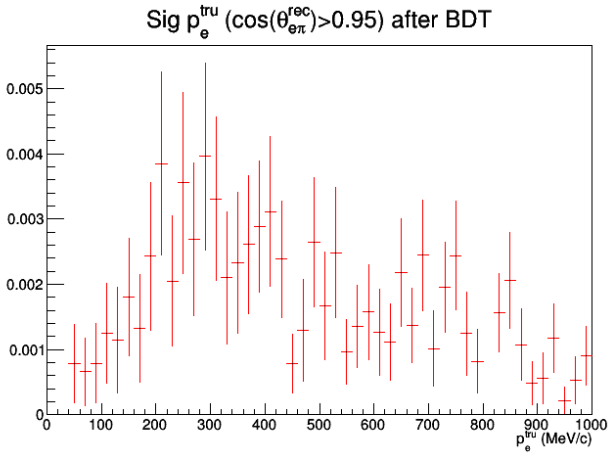


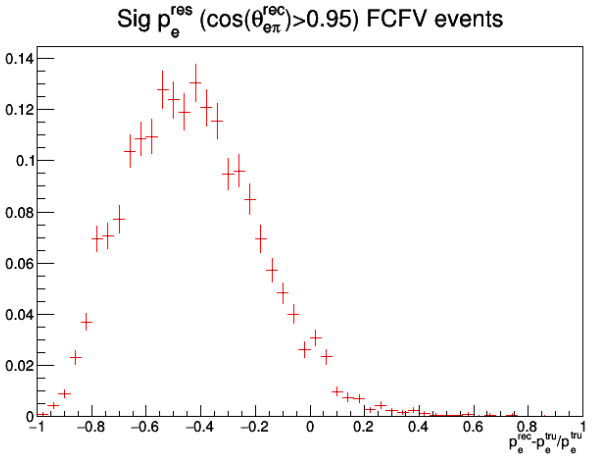


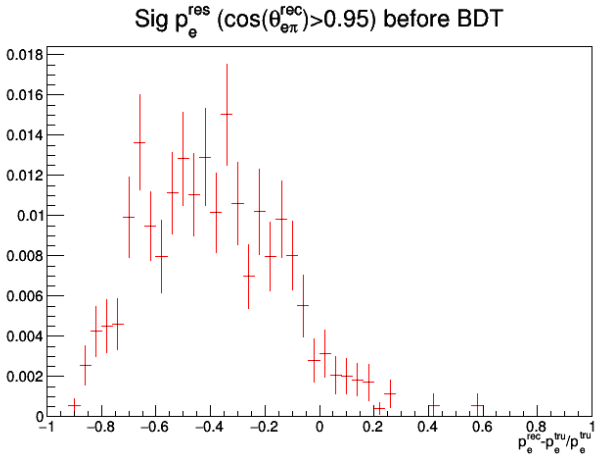
Signal p_e^{tru}, p_e^{res} (1de)

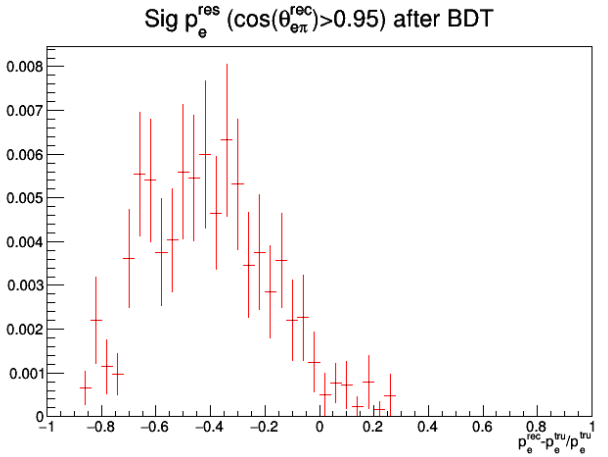






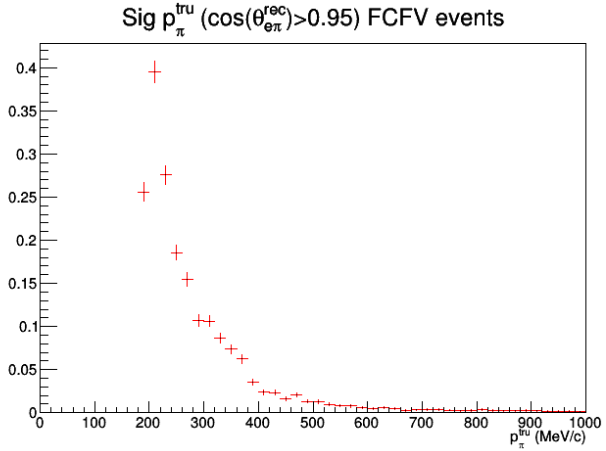


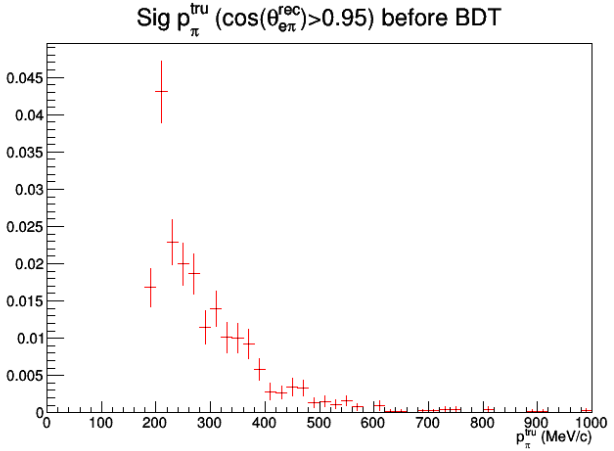


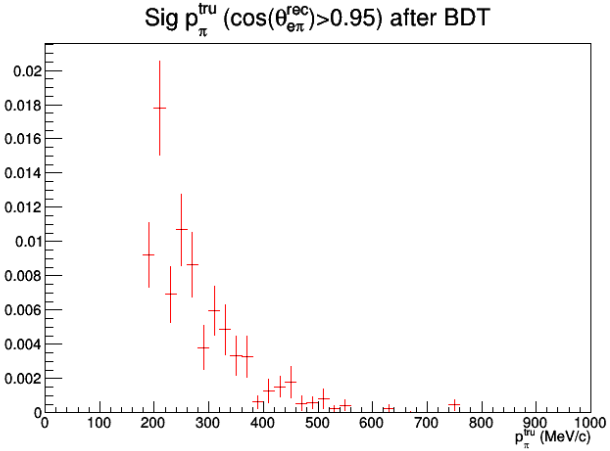


Signal p_π^{tru}(1de)

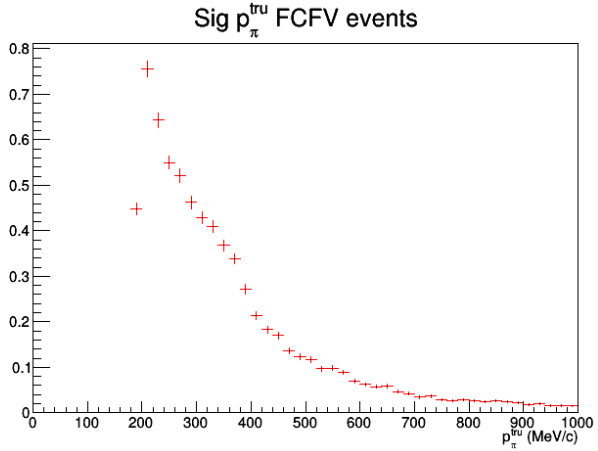
$\cos(\theta_{e\pi}^{rec})>0.95$

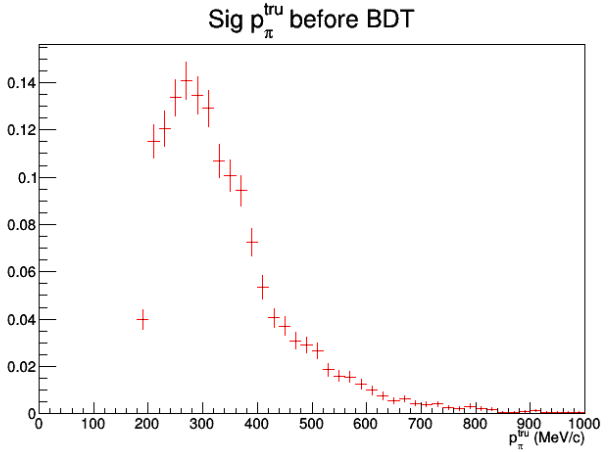


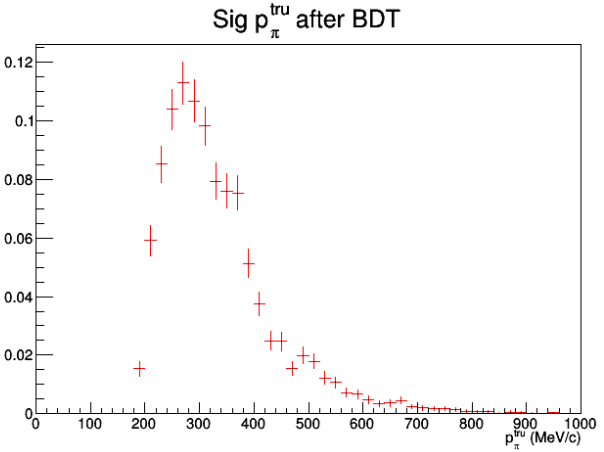




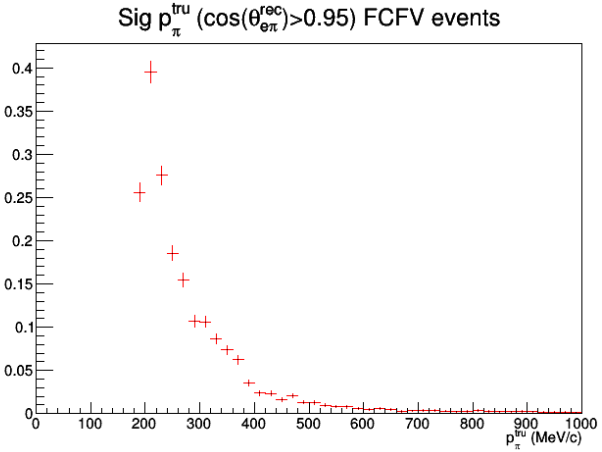
all events

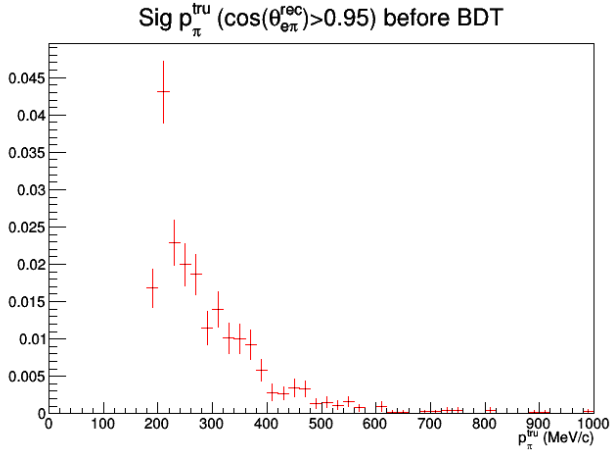


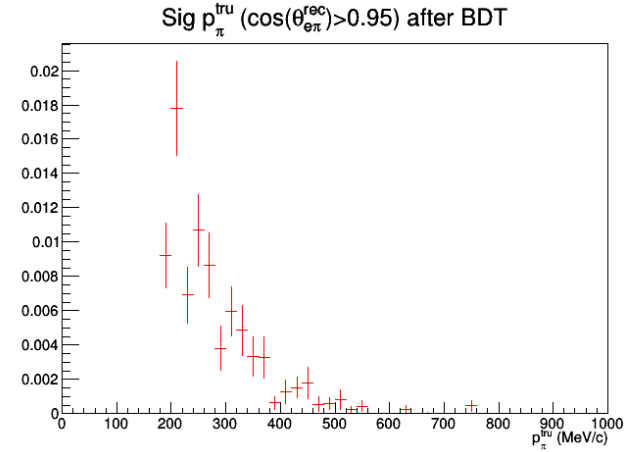


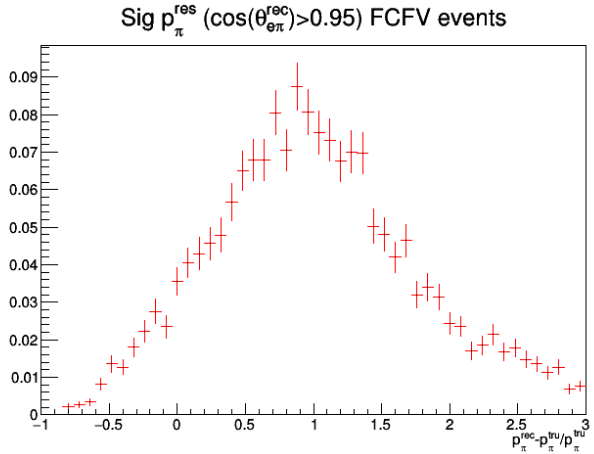


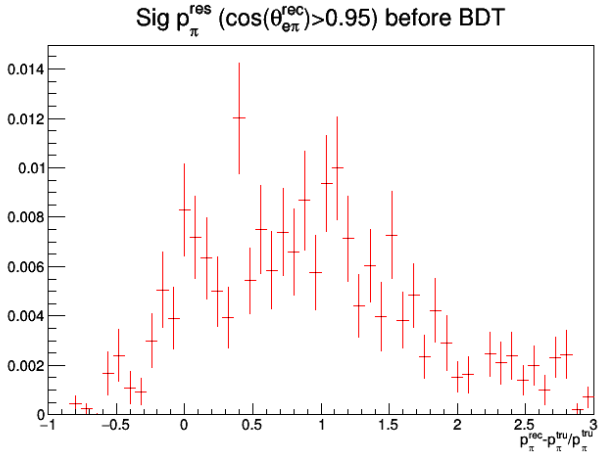
Signal p_π^{tru}, p_π^{res} (1de)

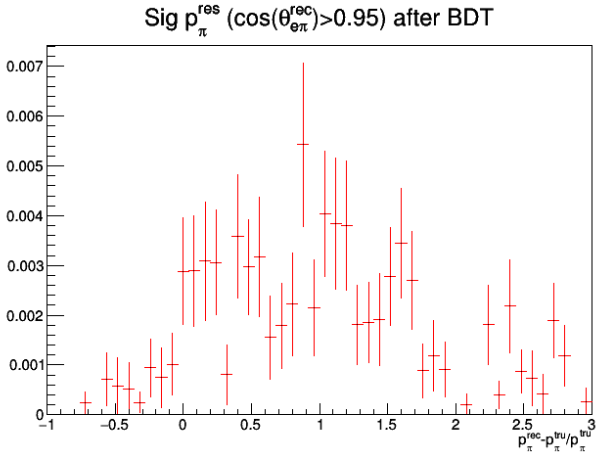




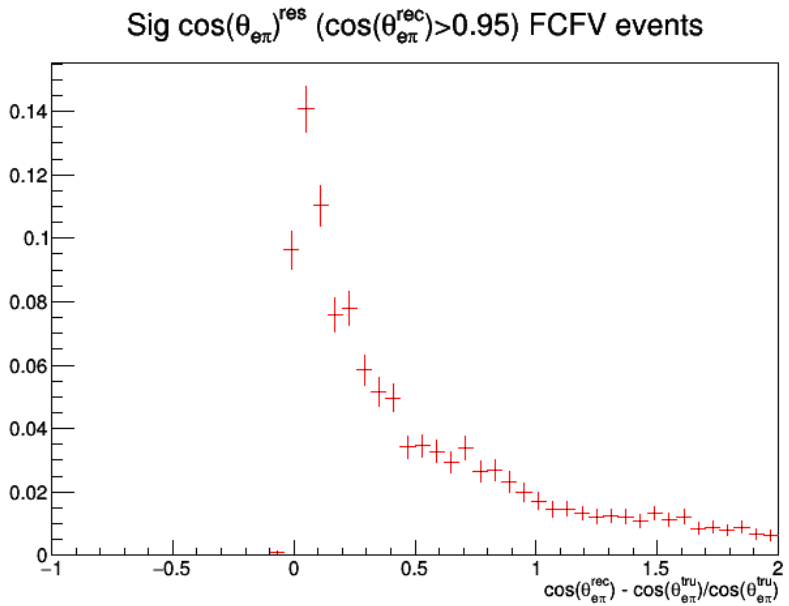


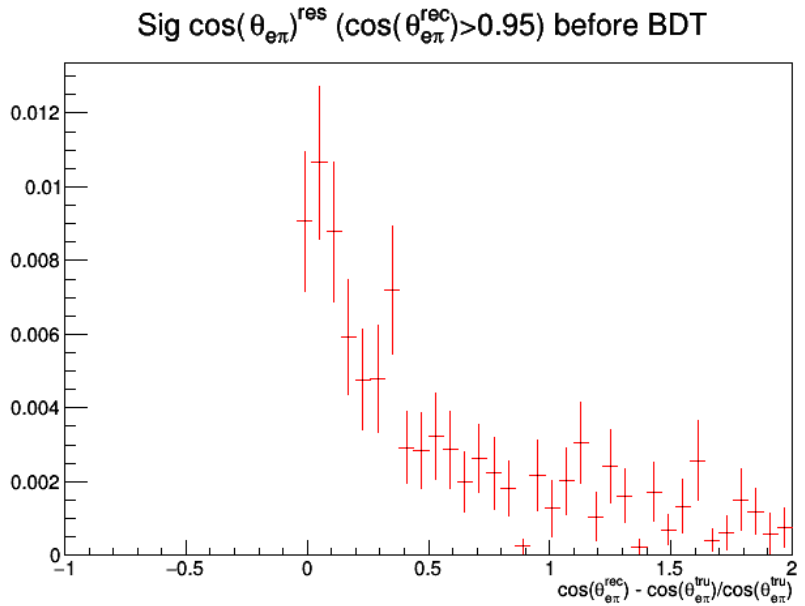


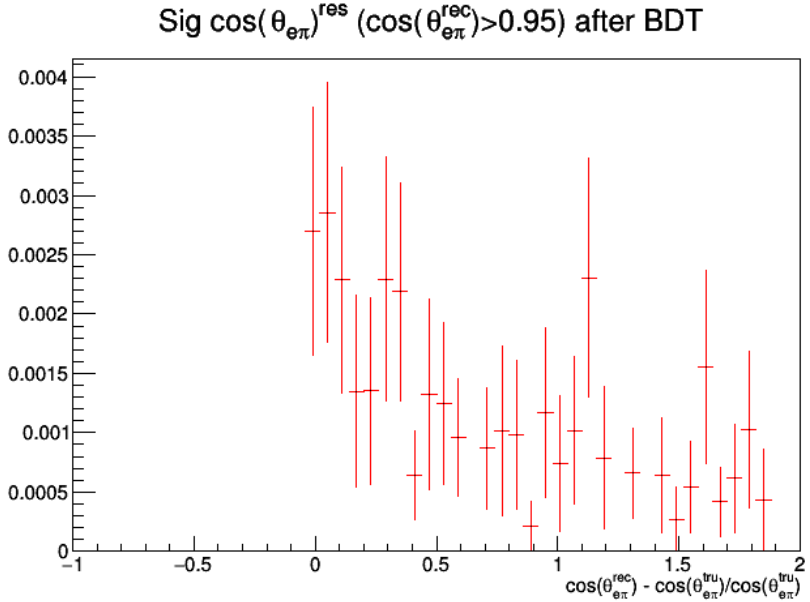




Signal $\cos(\theta_{e\pi})^{res}$ (1de)







Other Generators

- Trying to install NUWRO and GENIE
  - NUWRO
    - requires ROOT to be built with the PYTHIA6 library
      - not sure if this can be done on NEUT cluster – may have to re-install my own copy of ROOT
    - otherwise, installation and operation seems straightforward
  - GENIE
    - also requires that ROOT be built with PYTHIA6, as well as GSL
    - some more dependencies required – haven't look into it in detail yet