

Full Chain Simulation Reconstruction Software Validation Status

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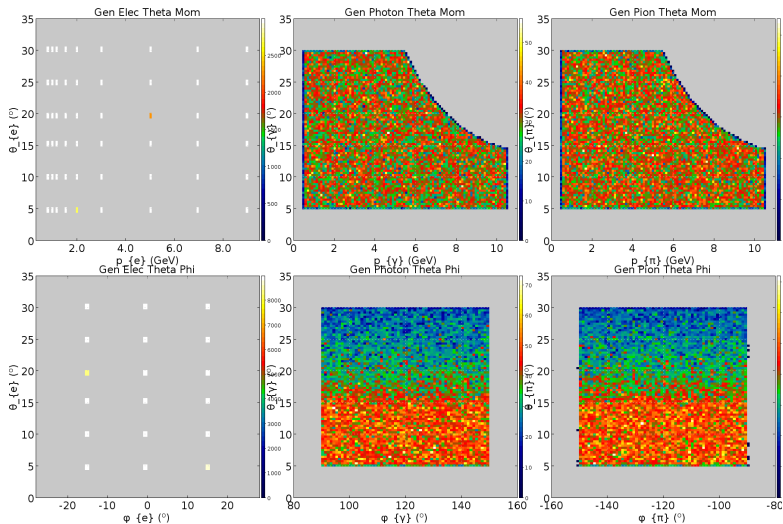
Jefferson Laboratory

June 13th 2017

Outline

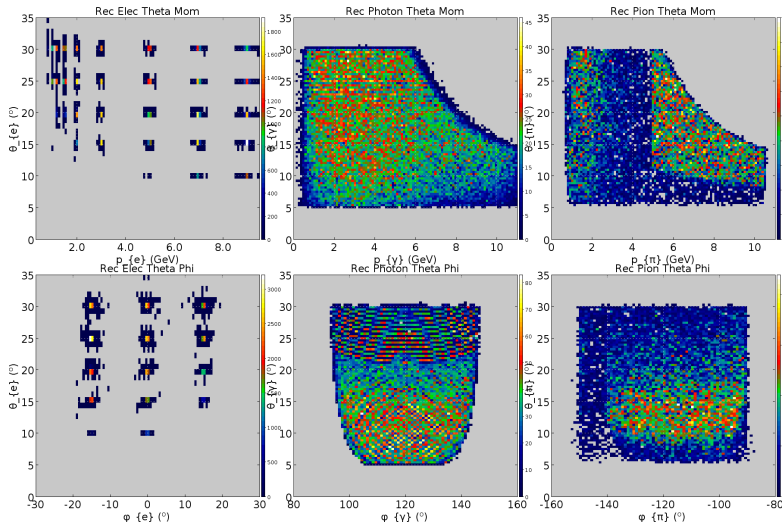
- 1 Kinematical Coverage
- 2 Electron Resolutions
- 3 Photon Resolutions
- 4 Positive Pion Resolutions
- 5 Summary

Generated Kinematics



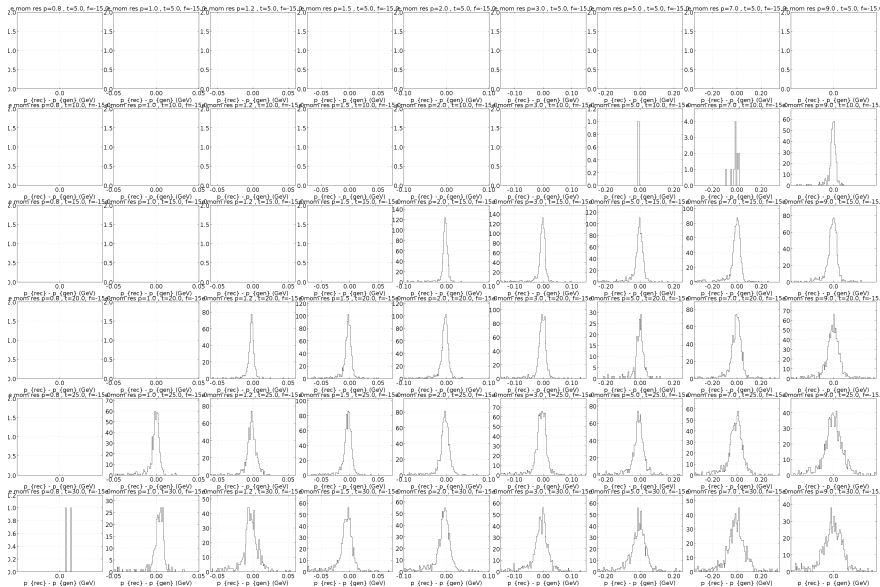
- 1000 event per e kinematics
- Full field inbending electrons

Reconstructed Kinematics

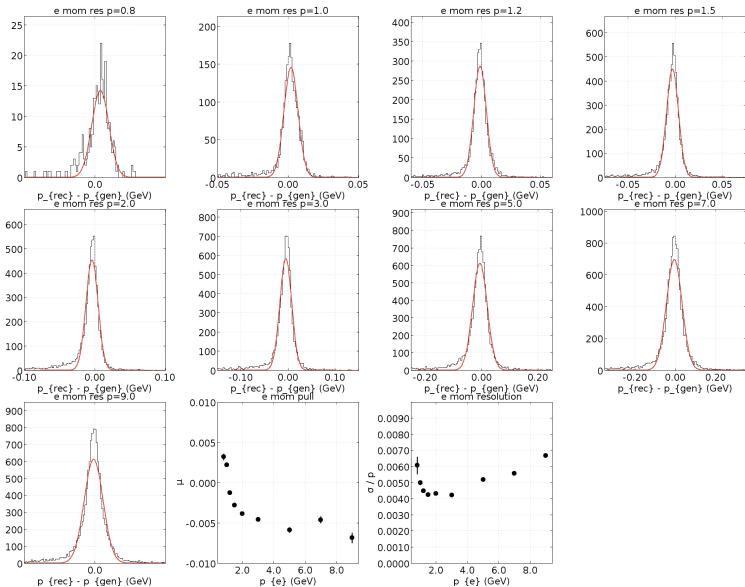


- Reconstructed 55k e, 110k γ , and 26k π^+

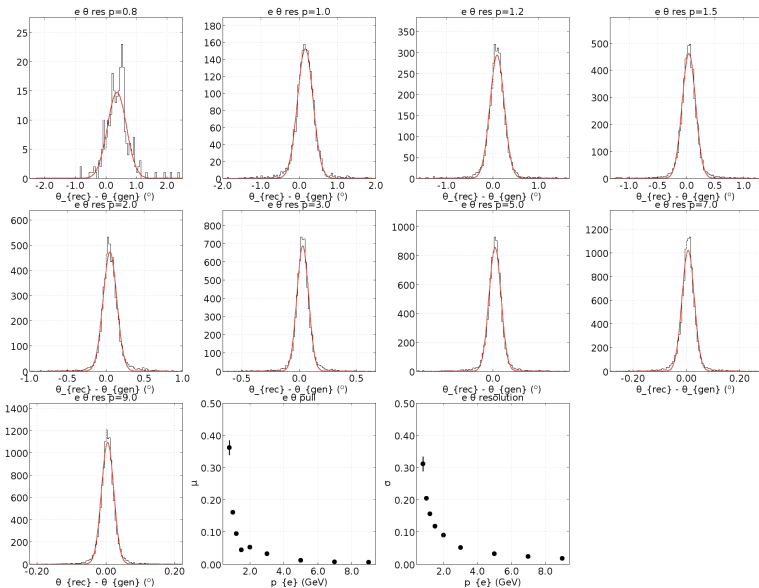
Extraction of Resolutions



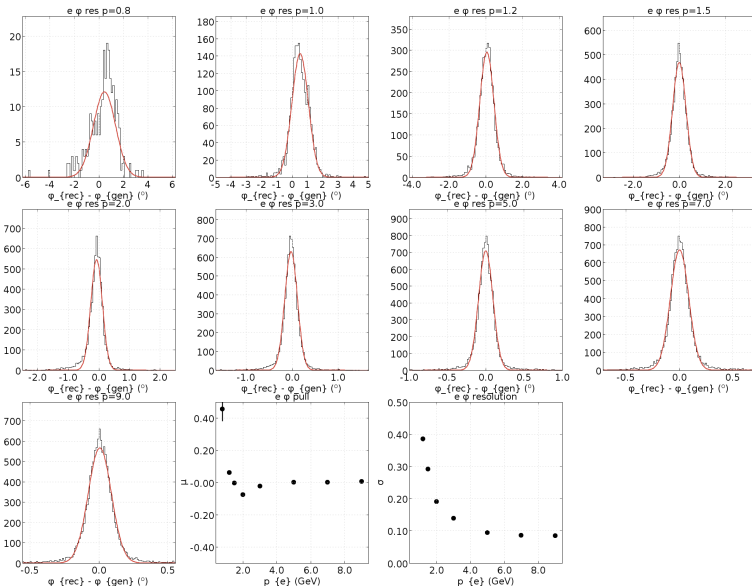
Inb. Electron Mom. Resolution



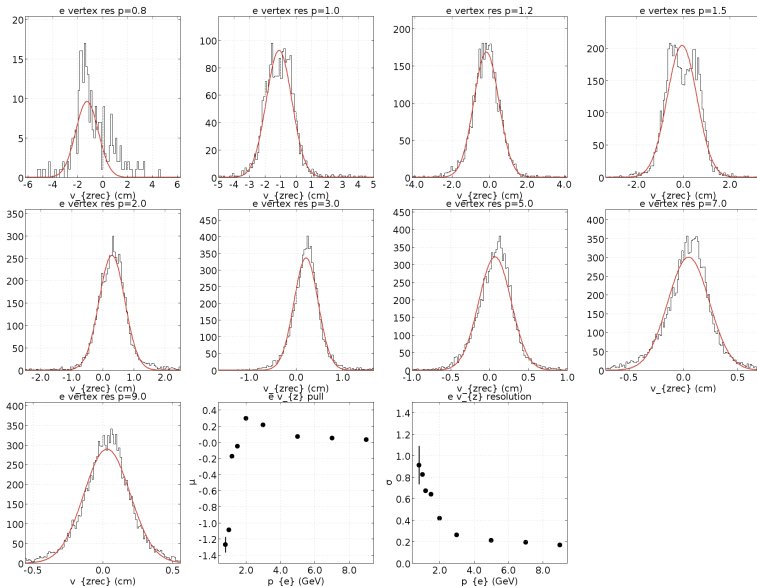
Inbending Electron Theta Resolution



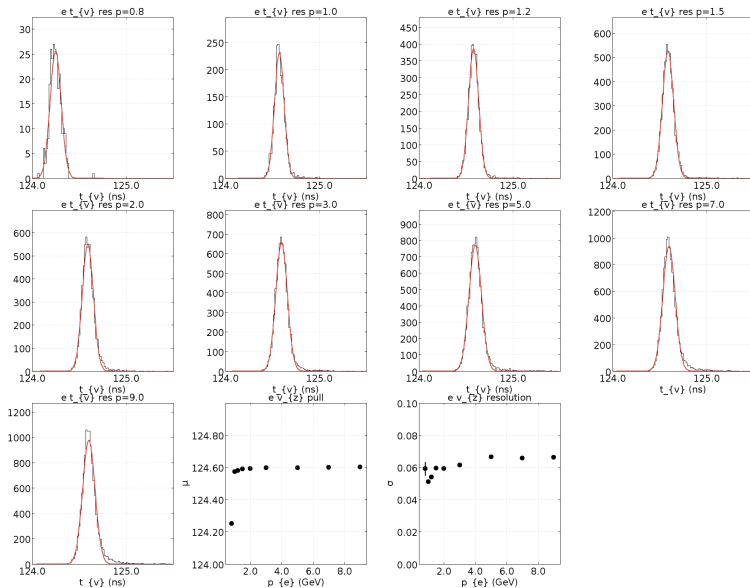
Inbending Electron Phi Resolution



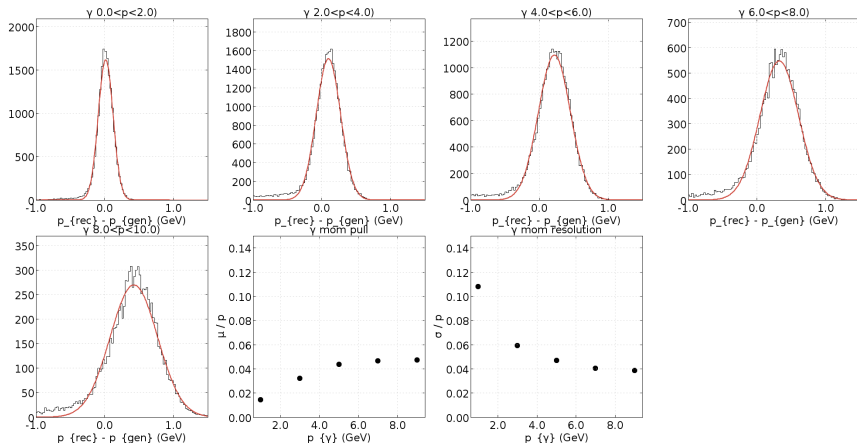
Inbending Electron Vertex Resolution



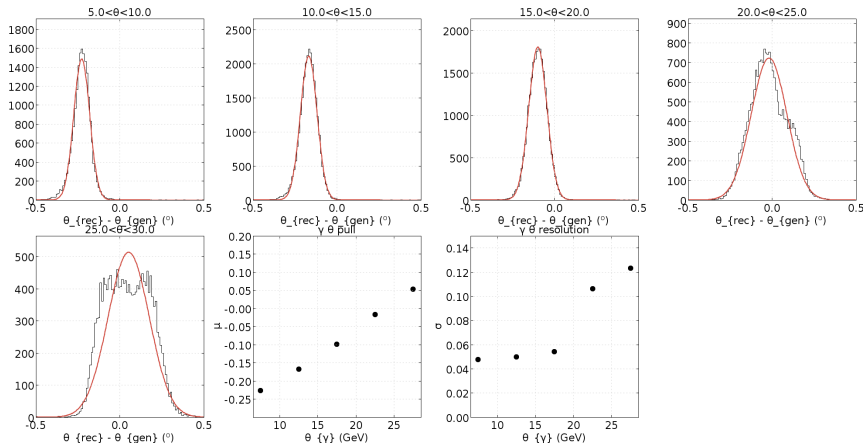
Inbending Electron Time Resolution



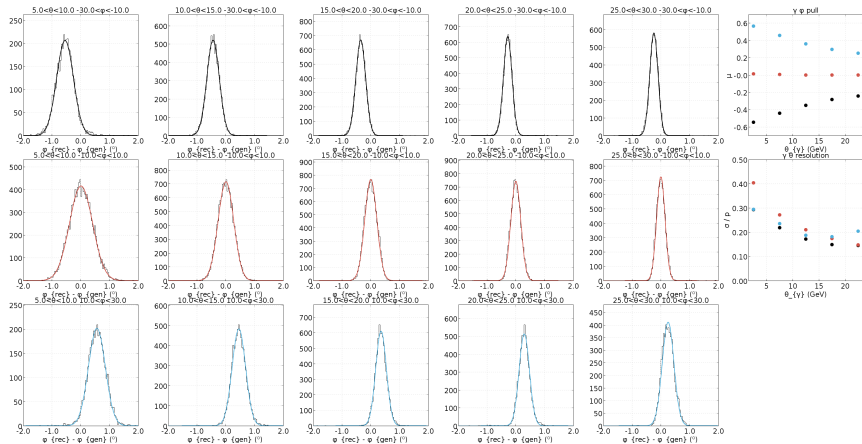
PCAL/EC Photon Energy Resolution



PCAL/EC Photon Theta Resolution



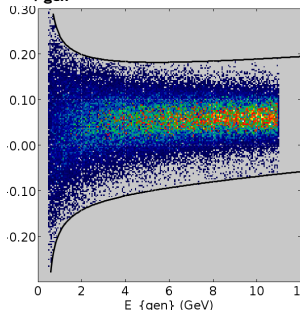
PCAL/EC Photon Phi Resolution



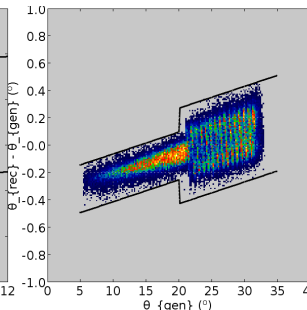
PCAL/EC Photon Resolutions

PCAL/EC resolution plots, from left to right :

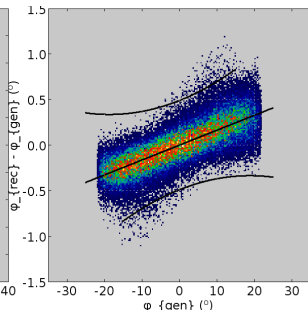
$\frac{p_{\text{rec}} - p_{\text{gen}}}{p_{\text{gen}}}$ vs p_{gen} ,



$\theta_{\text{rec}} - \theta_{\text{gen}}$ vs θ_{gen} ,



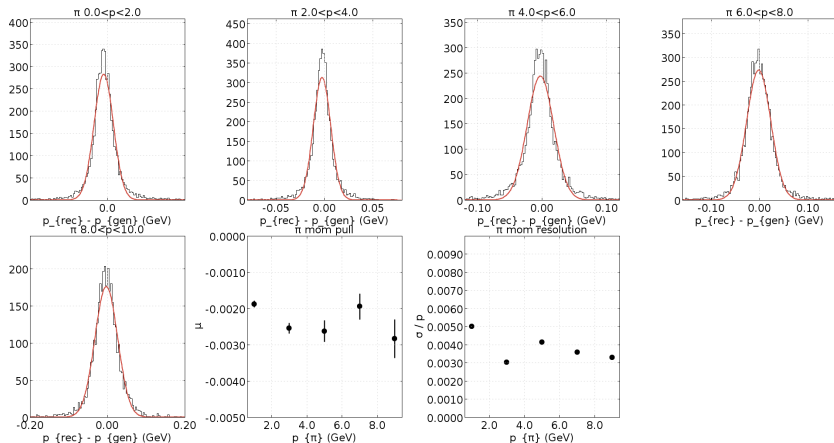
and $\phi_{\text{rec}} - \phi_{\text{gen}}$ vs ϕ_{gen}



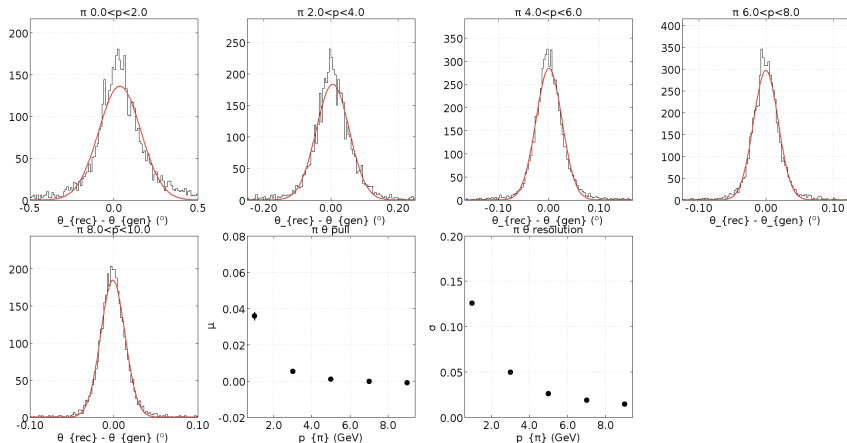
systematical shifts have been checked in 3D

$\Delta\phi(\phi)$ shifts has been fitted as a function of θ

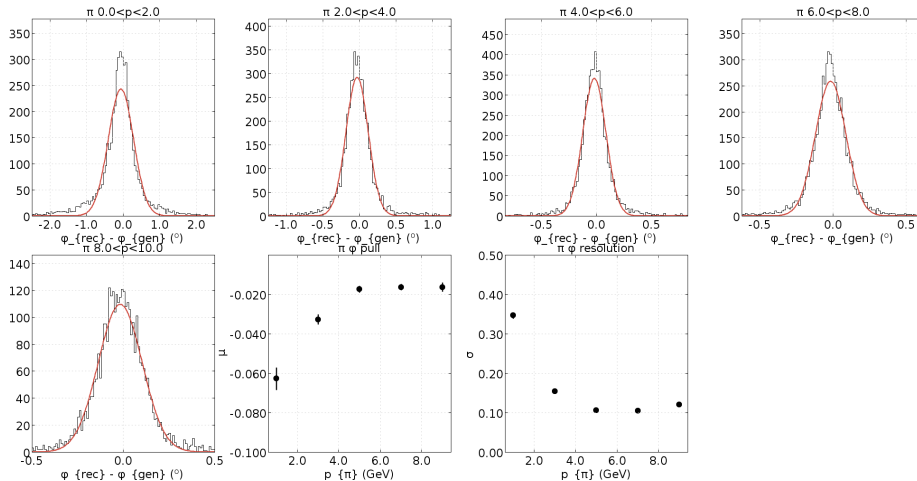
Outbending Pion Momentum Resolution



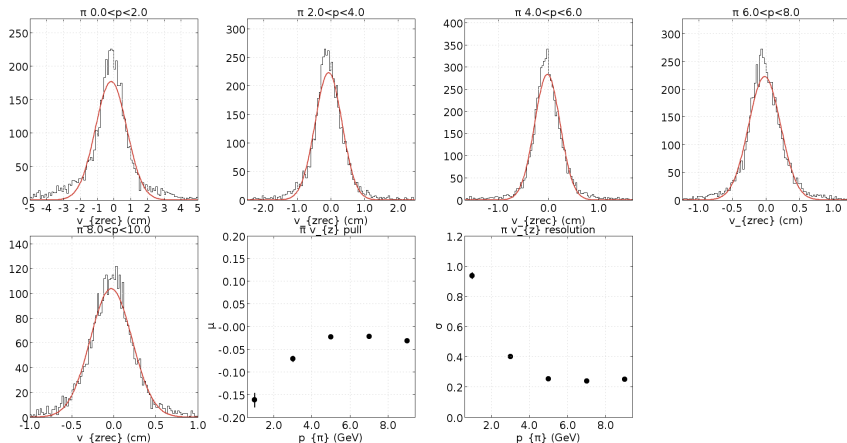
Outbending Pion Theta Resolution



Outbending Pion Phi Resolution

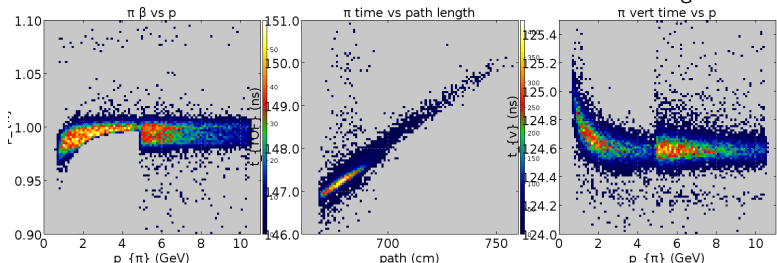


Outbending Pion Vertex Resolution



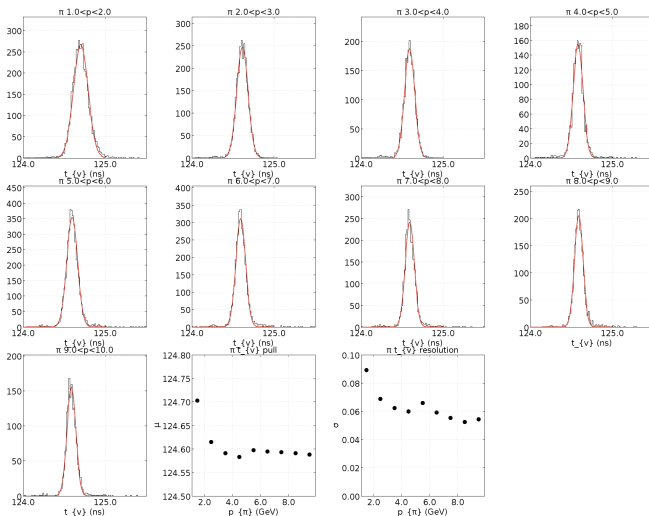
Outbending Pion Timing Resolution

Note that Pion PID Uses different detectors in Momentum Ranges



Energy loss correction at low momentum?
Slightly worse timing resolution in the HTCC

Outbending Pion Timing Resolution



Summary of current resolutions

