

Pythia+SIMC

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July 31, 2025

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KaonLT Experiment, Jefferson Lab Hall C

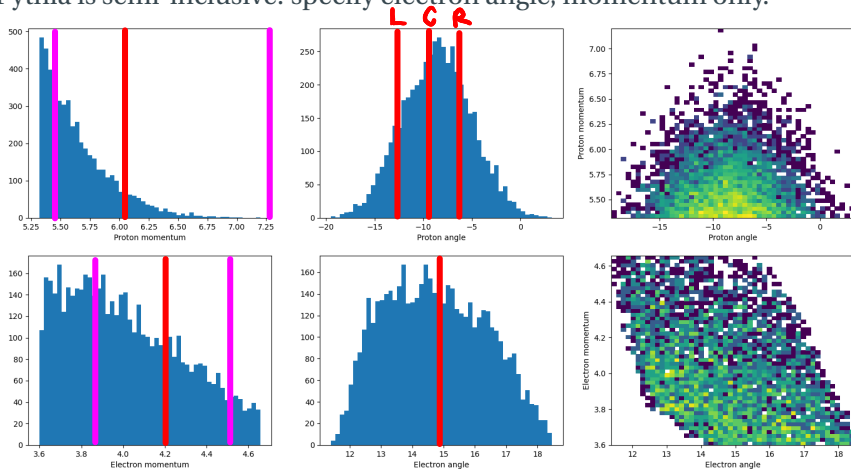


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Recap: Pythia kinematics



Pythia is semi-inclusive: specify electron angle, momentum only.

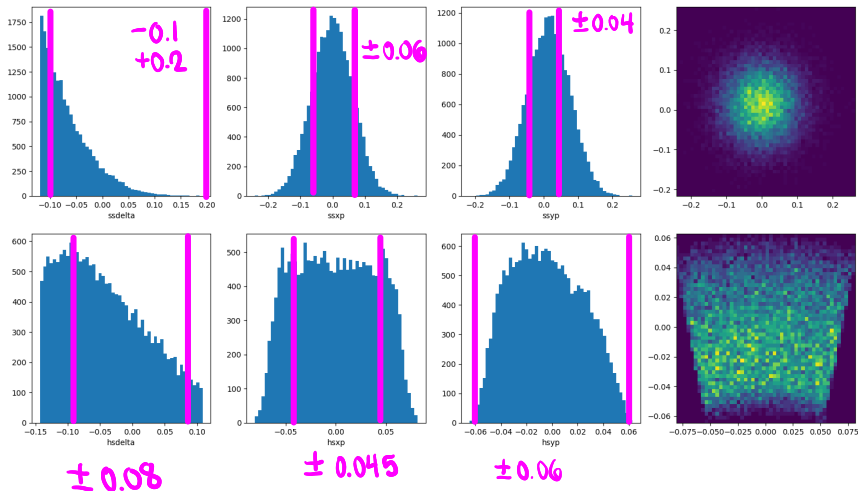


SHMS left, center, right all come from same Pythia file.

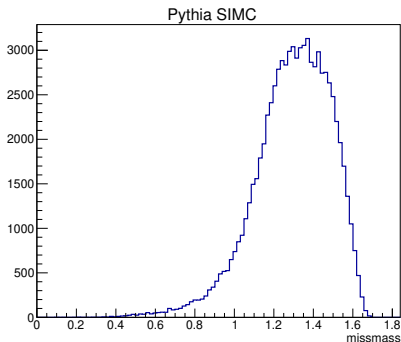
Edit: Pythia Event Acceptance Variables



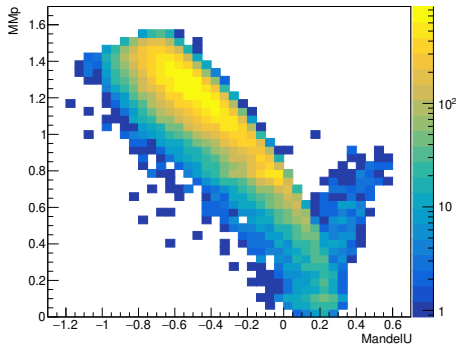
Miscalculation of yp. SHMS still has a wider distribution than spectrometer acceptance but is now properly centred at zero.



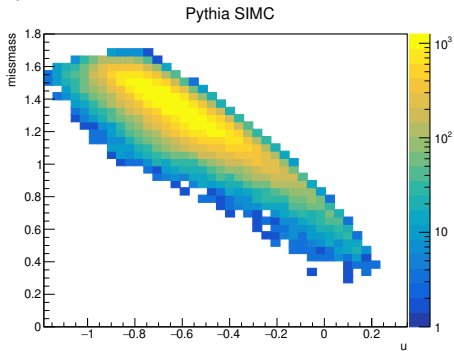
- **screen** does not allow the setup script to run: does not recognize LD_LIBRARY_PATH
- Utility **tmux** ("terminal multiplexer," similar to screen) does allow script to run
- Ran 1B pythia events: 1.2M passed cut: 80k passed through SIMC



Data

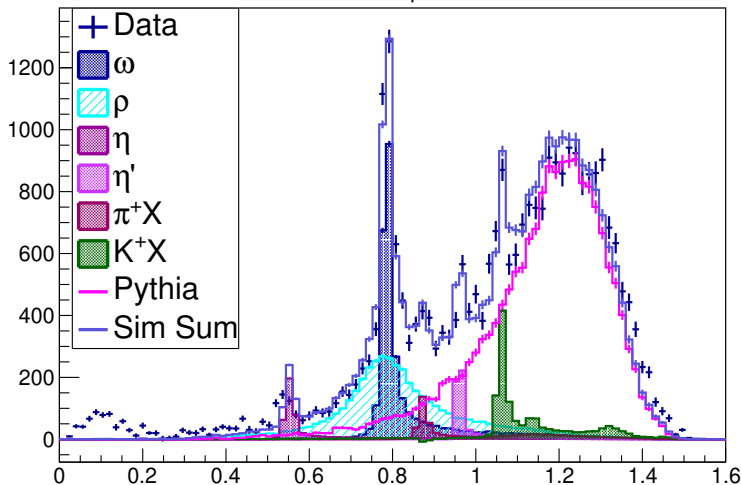


Pythia+SIMC



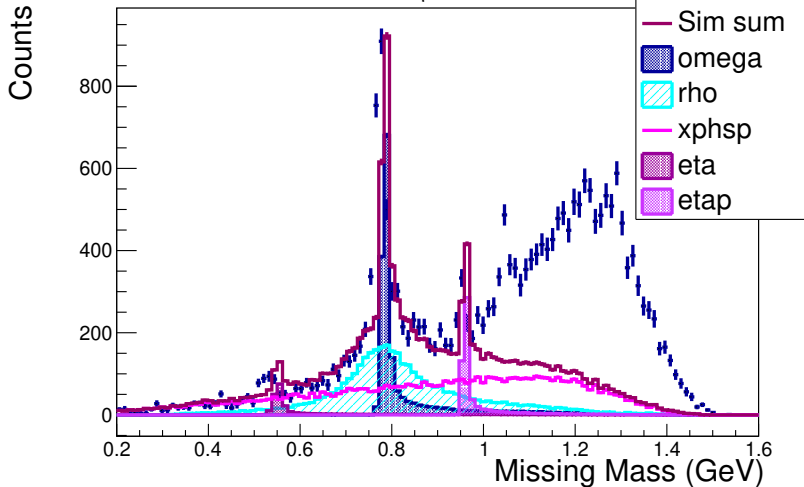
Q2=3, W=3.14, SHMS center

$$-3.142 < \phi < 3.142$$



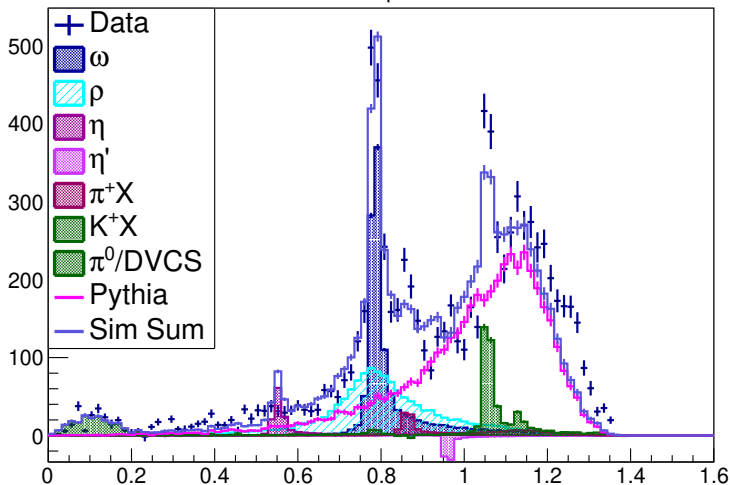
Q2=3, W=3.14, SHMS center

$$-180 < \phi < 180$$



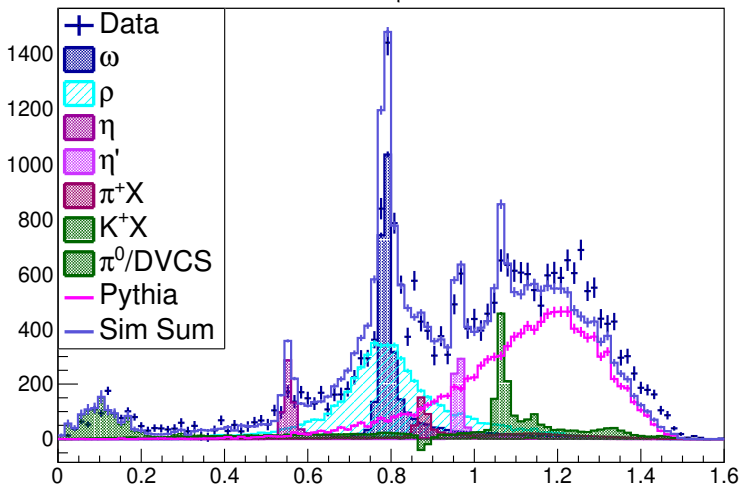
Q2=3, W=3.14, SHMS left

$$-3.142 < \phi < 3.142$$



Q²=3, W=3.14, SHMS right

$$-3.142 < \phi < 3.142$$





Implemented new fitting procedure:

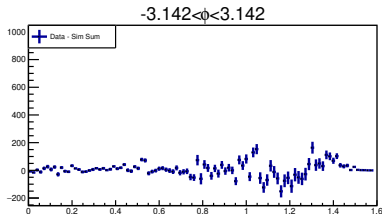
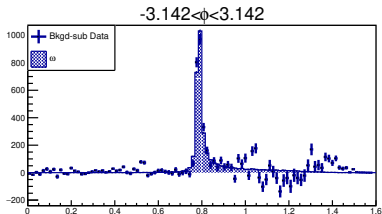
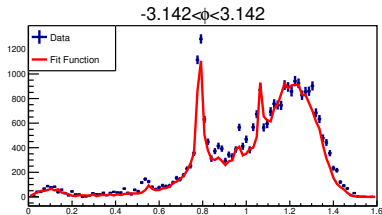
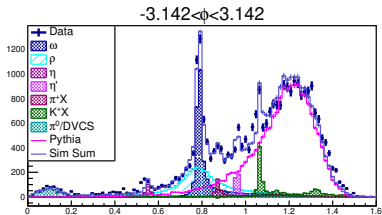
- Scale SIMC to data by matching integrals in the relevant region
- Create TF1 from sum of SIMC histograms
- Fit TF1 to data histogram
- Scale each SIMC histogram by the fit parameters

Added additional diagnostic plots

New Fitting Results (1)



All data $Q^2=3$, $W=3.14$, SHMS center

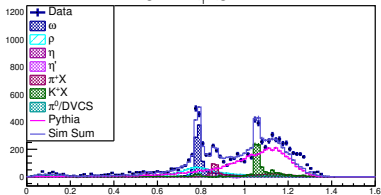


New Fitting Results (2)

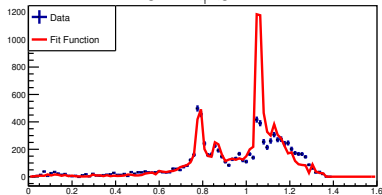


All data $Q^2=3$, $W=3.14$, SHMS left

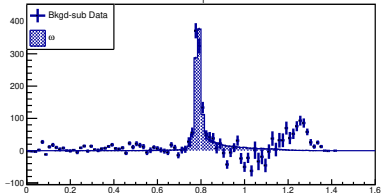
$-3.142 < \phi < 3.142$



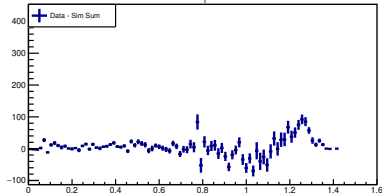
$-3.142 < \phi < 3.142$



$-3.142 < \phi < 3.142$



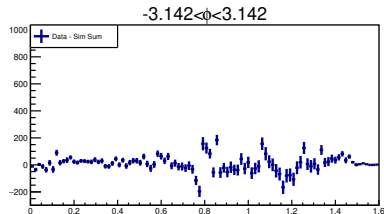
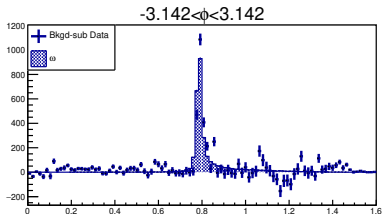
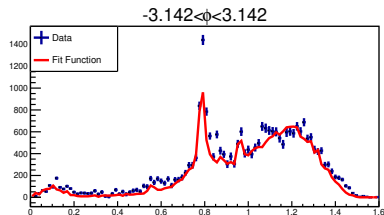
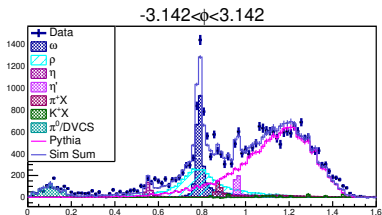
$-3.142 < \phi < 3.142$



New Fitting Results (3)



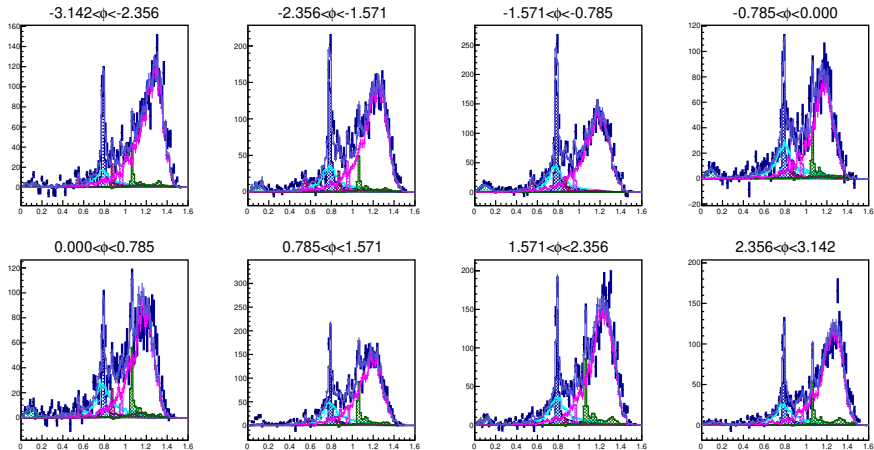
All data Q2=3, W=3.14, SHMS right



Binned Shape Study (1)



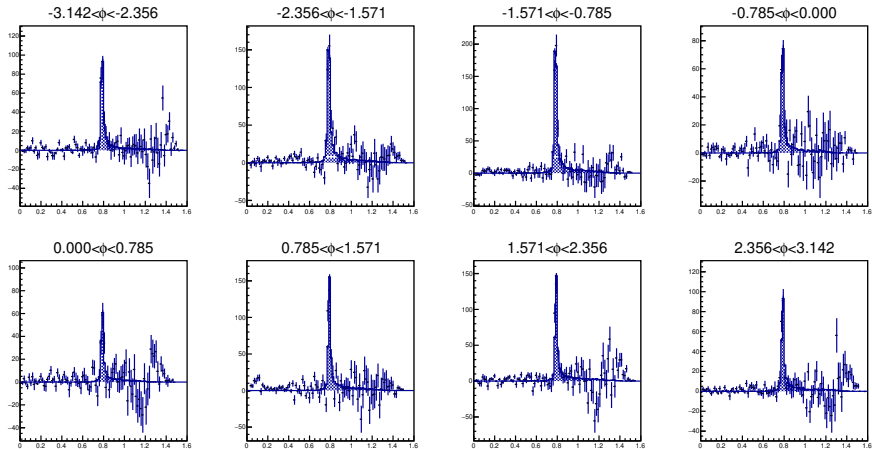
Q2=3, W=3.14, SHMS center: Data vs SIMC



Binned Shape Study (2)



Q2=3, W=3.14, SHMS center: Background-subtracted data vs ω SIMC



Binned Shape Study (3)



Q2=3, W=3.14, SHMS center: Data minus simulation sum (residuals)

