

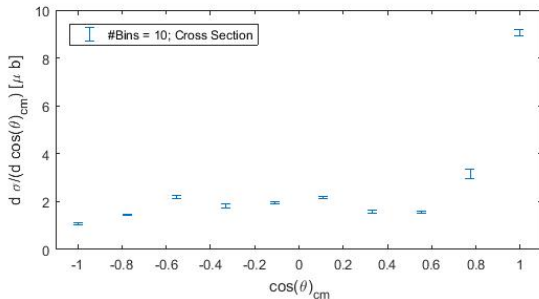
Omega Cross-Section

Martin Sobotzik

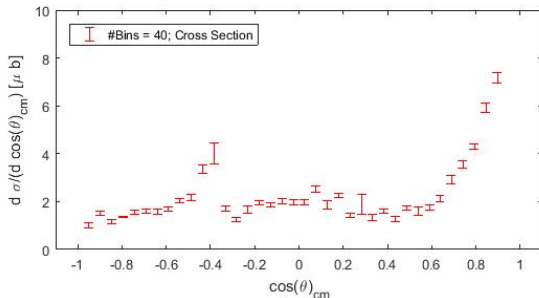
Mainz, March 2019

Institute for Nuclear Physics
Johannes Gutenberg University of Mainz

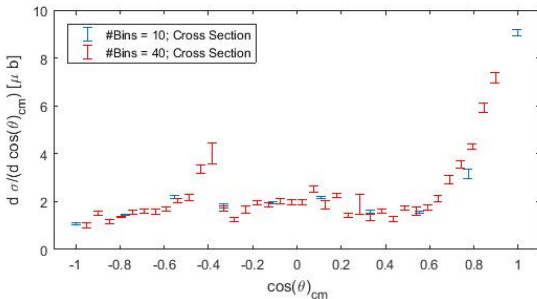




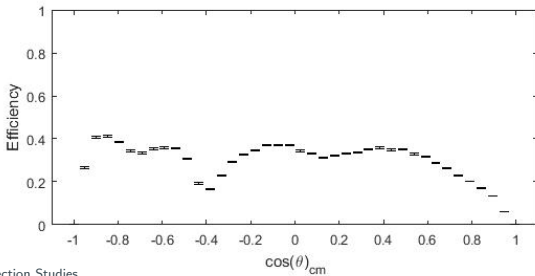
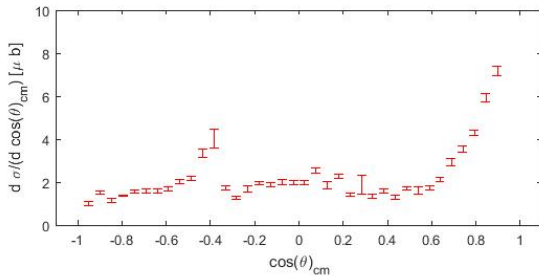
Olis Cross Section; Dip at about $\cos(\theta) = -0.3$



Increased number of bins to 40; now there is still a dip at $\cos(\theta) = -0.3$ but also a peak at $\cos(\theta) = -0.5$



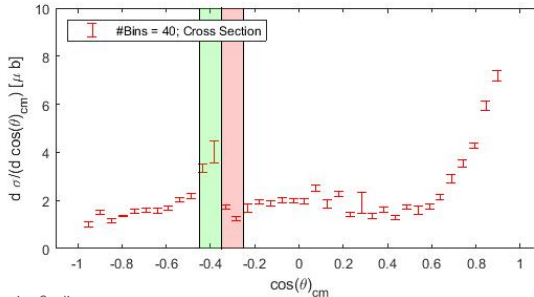
Both Cross Sections are shown.



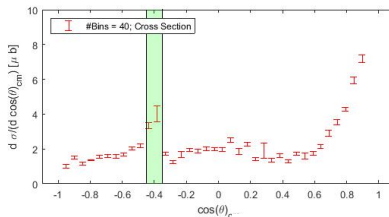


Closer look at:

- ω
- π^0
- Proton
- Bachelor Photon
- $\gamma\gamma$

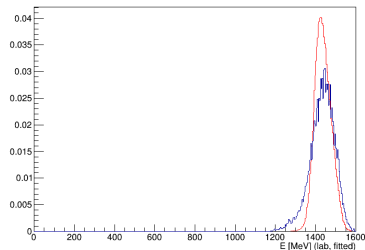
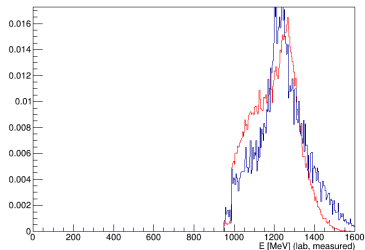


Energy of Proton for $\cos(\theta_\omega) = [-0.45, -0.35]$ (Peak)



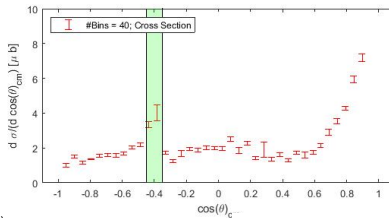
E (lab) Proton

E (lab) Proton



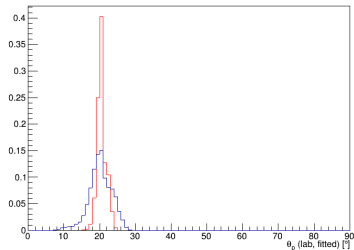
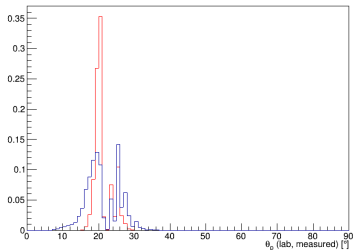
Energy of protons for $\cos(\theta_\omega) = [-0.45, -0.35]$. Red are MC and blue are beamtime data. Left side is just measured, right side is after KFit.

θ of Proton for $\cos(\theta_\omega) = [-0.45, -0.35]$ (Peak)



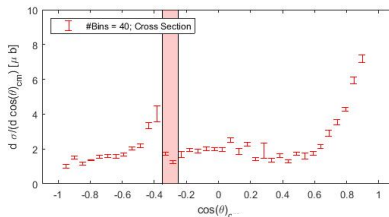
θ_p (lab)

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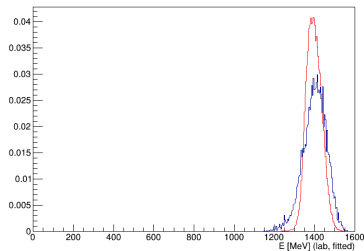
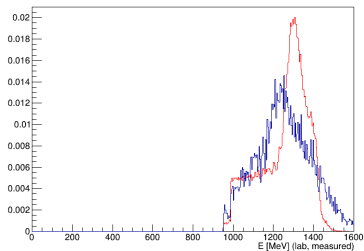
θ of protons for $\cos(\theta_\omega) = [-0.45, -0.35]$. Red are MC and blue are beamtime data. Left side is just measured, right side is after KFit.

Energy of Protons for $\cos(\theta_\omega) = [-0.35, -0.25]$ (Dip)



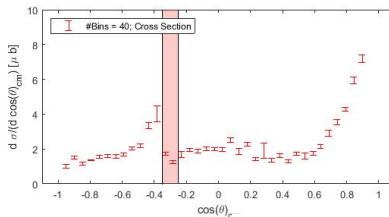
E (lab) Proton

E (lab) Proton



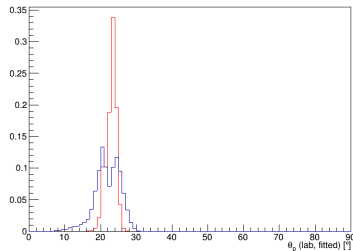
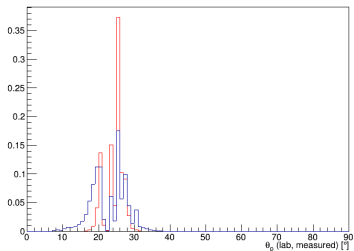
Energy of protons for $\cos(\theta_\omega) = [-0.35, -0.25]$. Red are MC and blue are beamtime data. Left side is just measured, right side is after KFit.

θ of Proton for $\cos(\theta_\omega) = [-0.35, -0.25]$ (Dip)

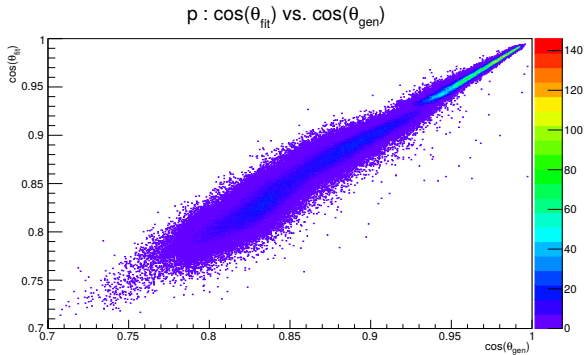


θ_p (lab)

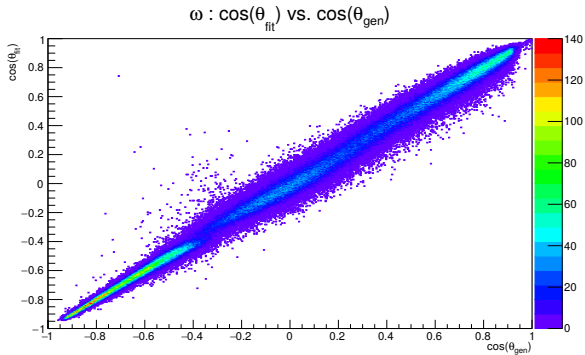
θ_p (lab)



θ of protons for $\cos(\theta_\omega) = [-0.35, -0.25]$. Red are MC and blue are beamtime data. Left side is just measured, right side is after KFit.



$\cos(\theta_{fit})$ vs. $\cos(\theta_{gen})$ for all protons.



$\cos(\theta_{fit})$ vs. $\cos(\theta_{gen})$ for all ω .

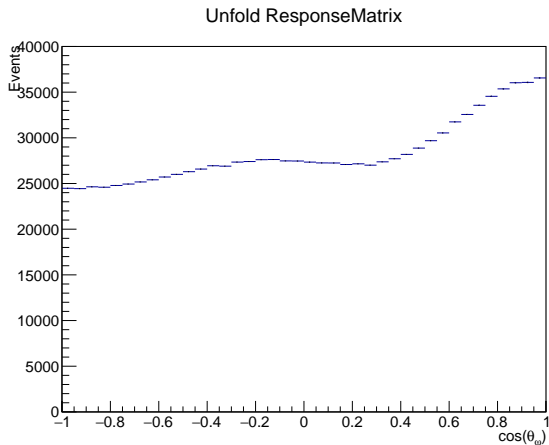
Unfolding

- μ is the *true* distribution given by nature
- detector effects are then described by the response function R .
(inefficiencies, bias and smearing)
- This results in the distribution ν .

$$\nu_i = \sum_{j=1}^M R_{ij} \mu_j$$

- With infinite statistics, it would be possible to recover the original distribution by inverting the response matrix

$$\mu = R^{-1} \nu$$



Flat ω was used. MC fitted data were unfolded.