Omega Cross-Section

Martin Sobotzik

Institute for Nuclear Physics
Johannes Gutenberg University of Mainz

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Starting Point

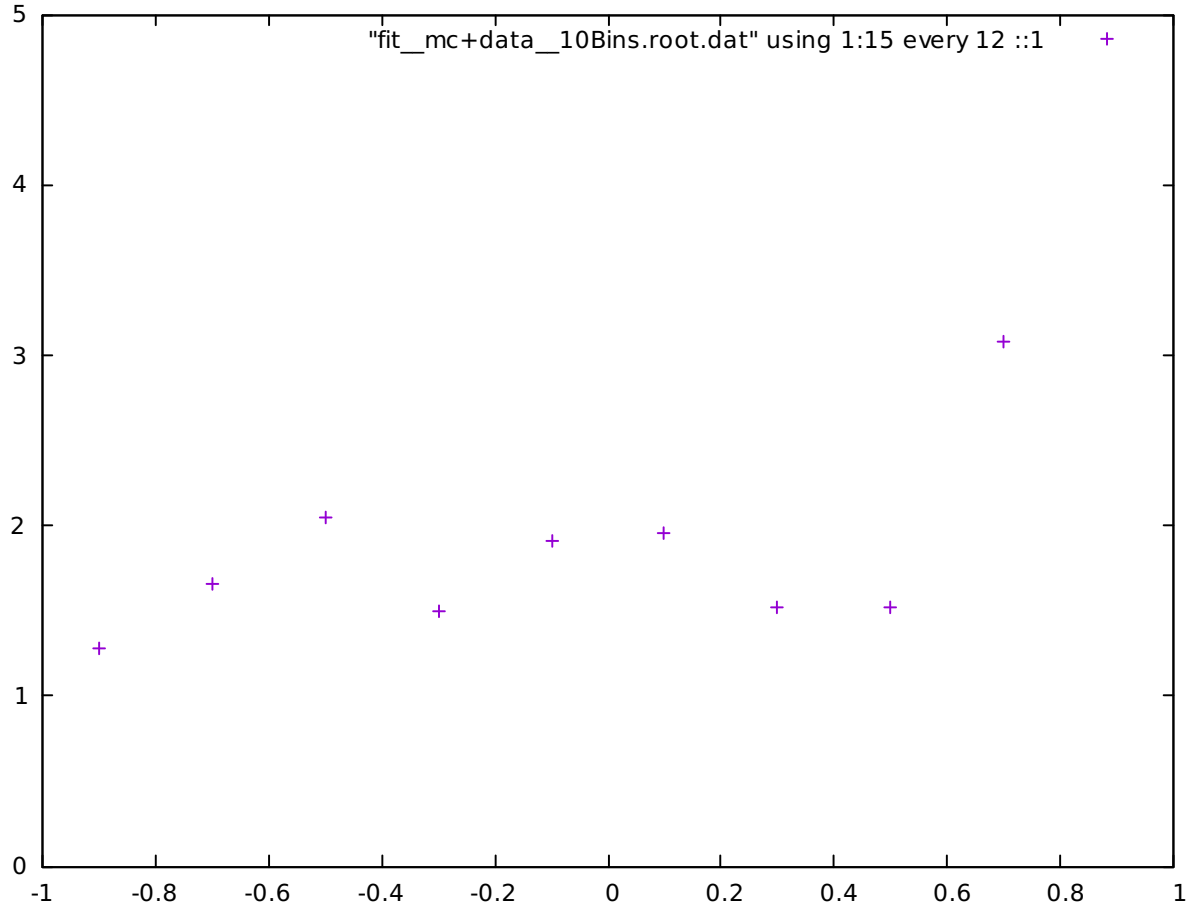

Figure 1: Olis Data; Dip at about $\cos(\theta) = -0.3$

More Points

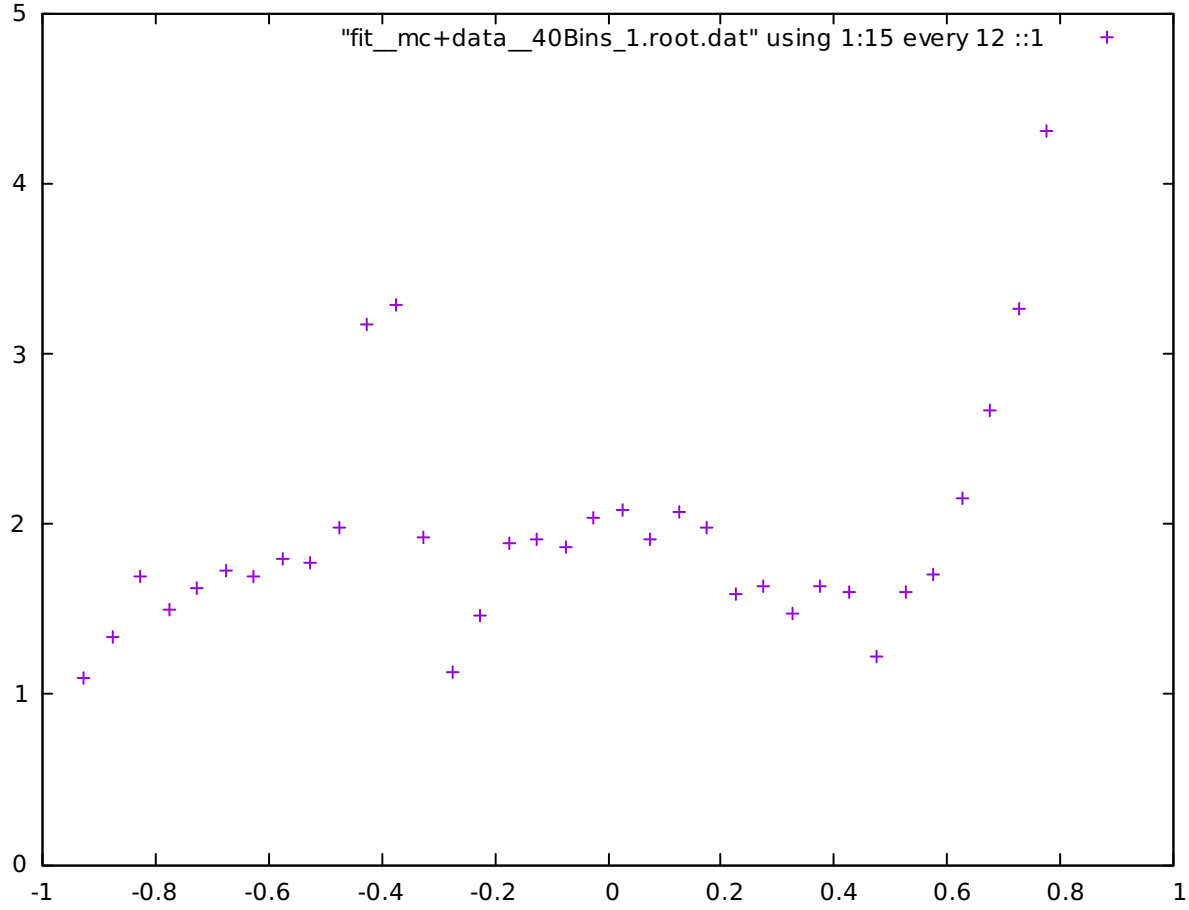

Figure 2: Increased number of points; now there is still a dip at $\cos(\theta) = -0.3$ but also a peak at $\cos(\theta) = -0.5$

More Points

Increased the number of points from 10 to 40

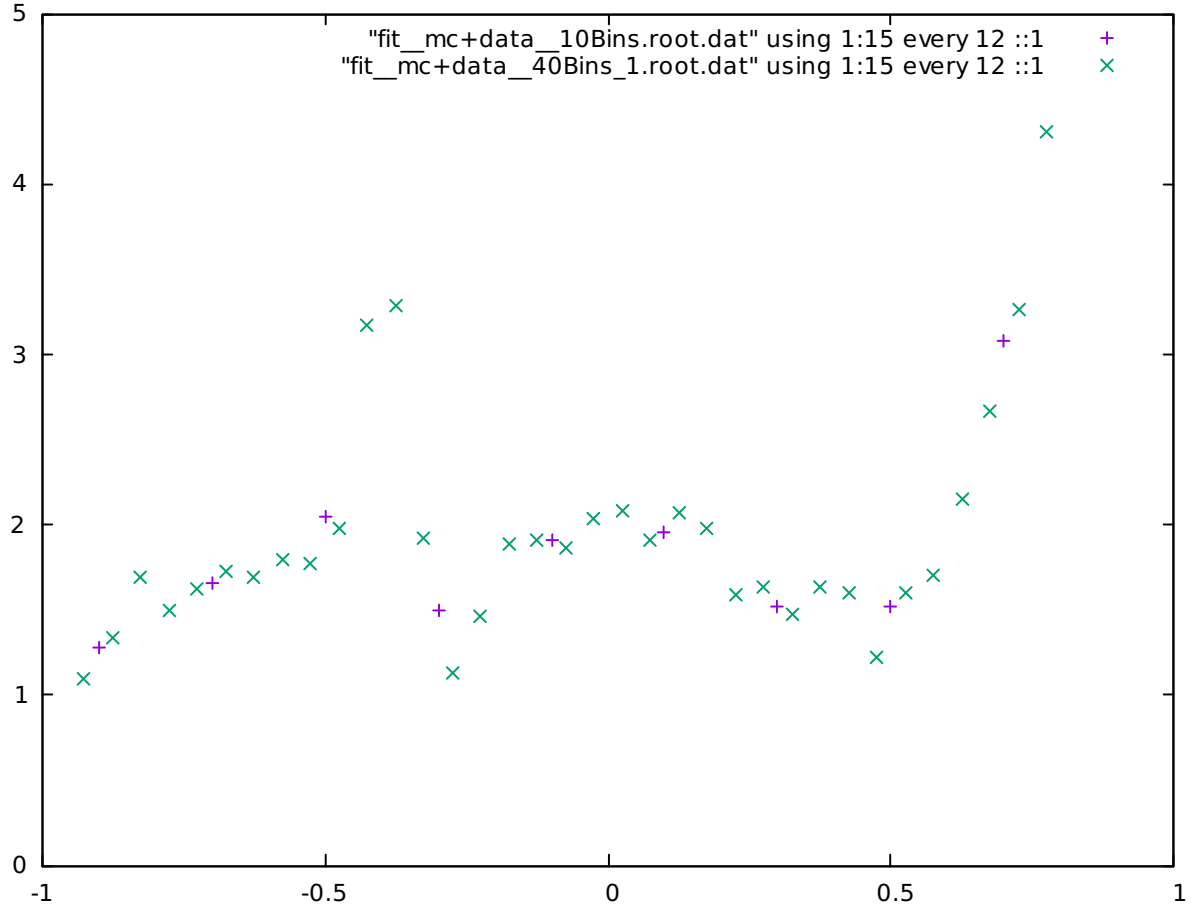

Figure 3: Overlap

Efficiency

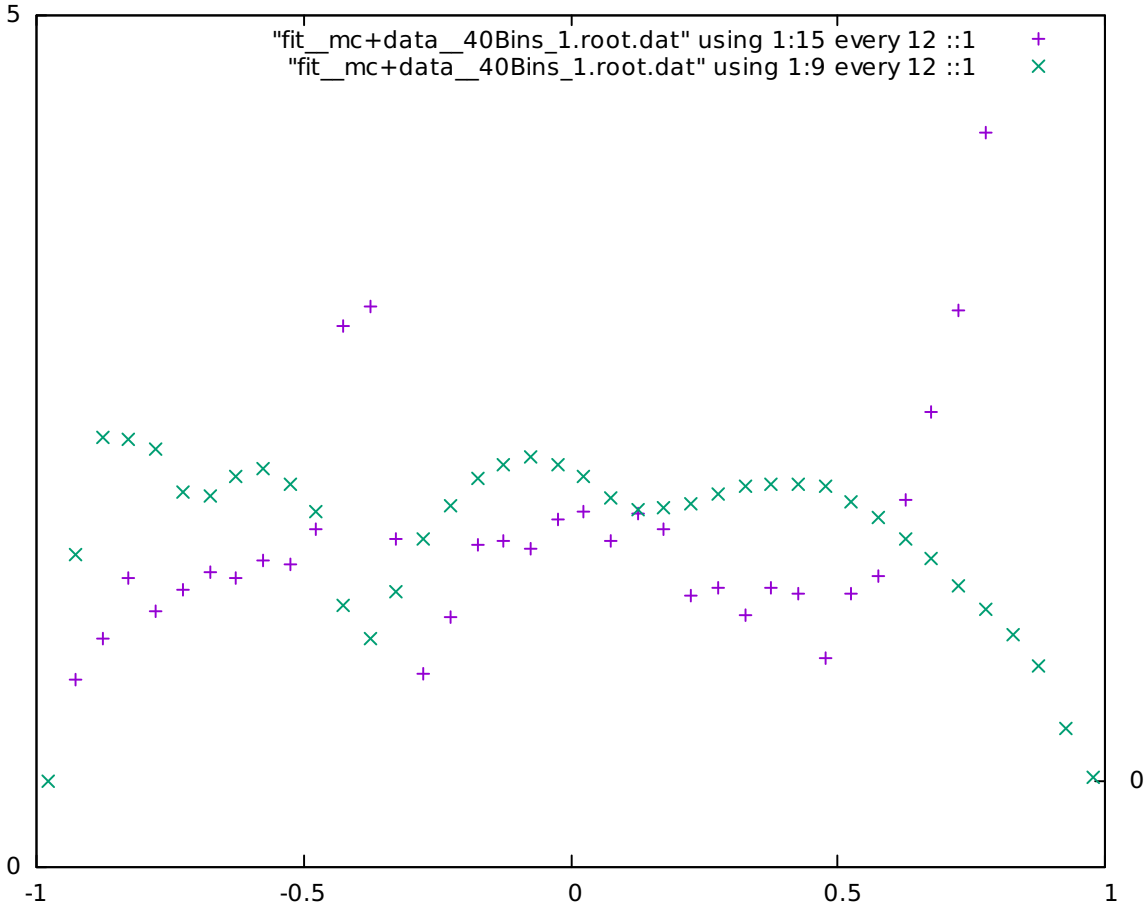

Figure 4: There is a efficiency drop at $\cos(\theta) = -0.3$

Looking at different particles

$$\omega \rightarrow \gamma \; \underset{\hookrightarrow \gamma\gamma}{\pi^0} \tag{1}$$

Closer look at:

- ω
- Bachelor Photon
- π^0
- $\gamma\gamma$
- Proton
- $\cos(\theta) = [-0.35, -0.25]$ Dip
- $\cos(\theta) = [-0.45, -0.35]$ Peak

and compare MC with Beamtime Data (both reconstructed)

Used Cuts:

- w_taggW ("TaggW");
- w_mass_Cut("ggg.M()>700");
- cut_KCut("KinFitProb $>$ 0.2 && nCandsInput $==$ 4 && copl_angle $<$ 0.05");

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

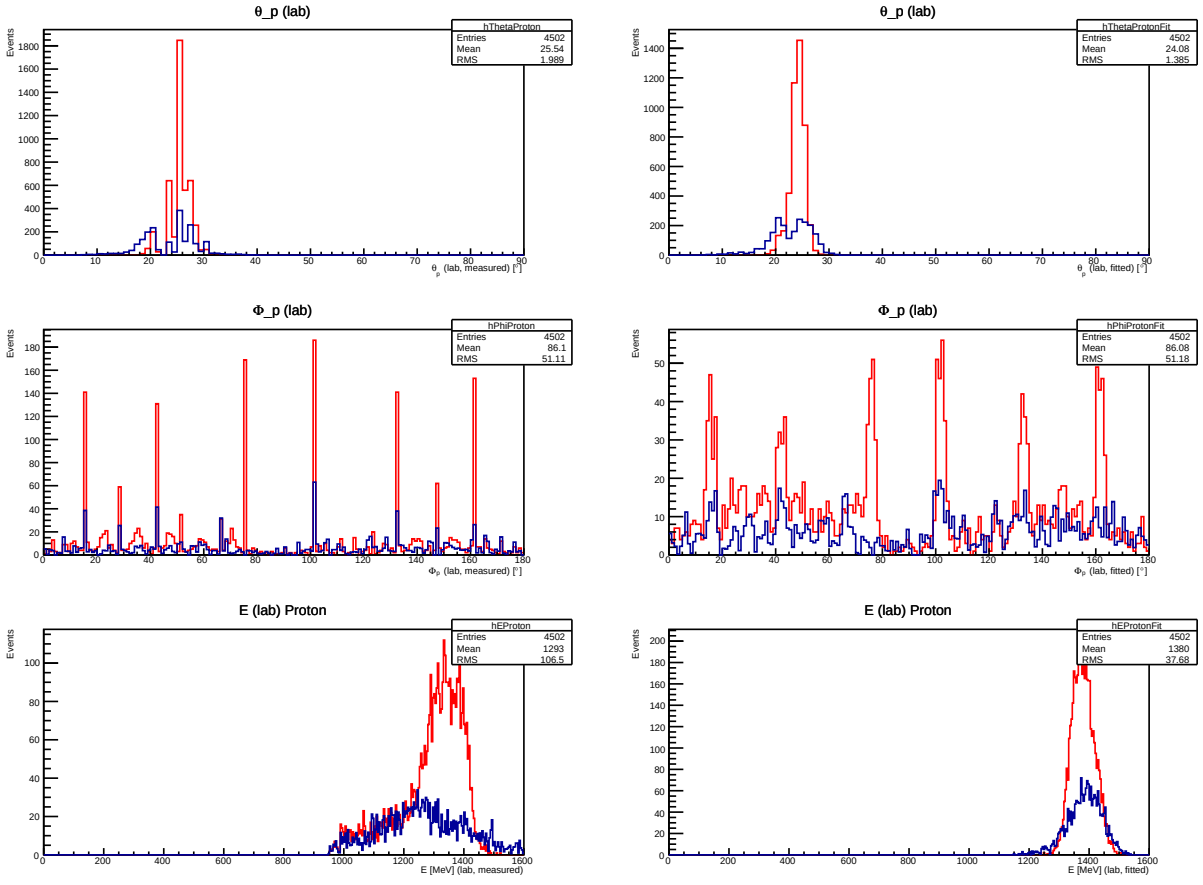

Figure 5: Red: MC; Blue Beamtime Data; Protons for $\cos(\theta_\omega) = [-0.35, -0.25]$; Right Side are fitted data

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

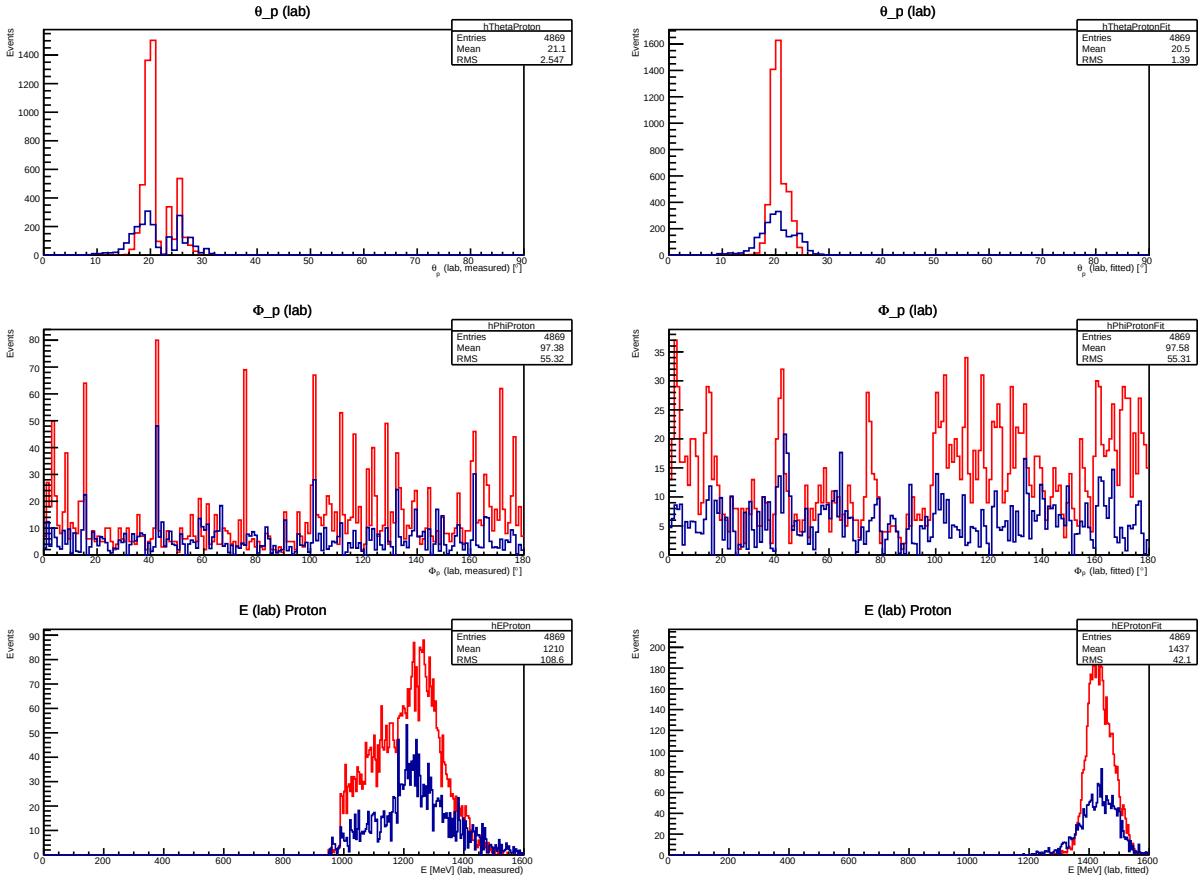

Figure 6: Red: MC; Blue Beamtime Data; Protons for $\cos(\theta_\omega) = [-0.45, -0.35]$; Right Side are fitted data

Proton: θ_{fit} vs. θ_{gen}

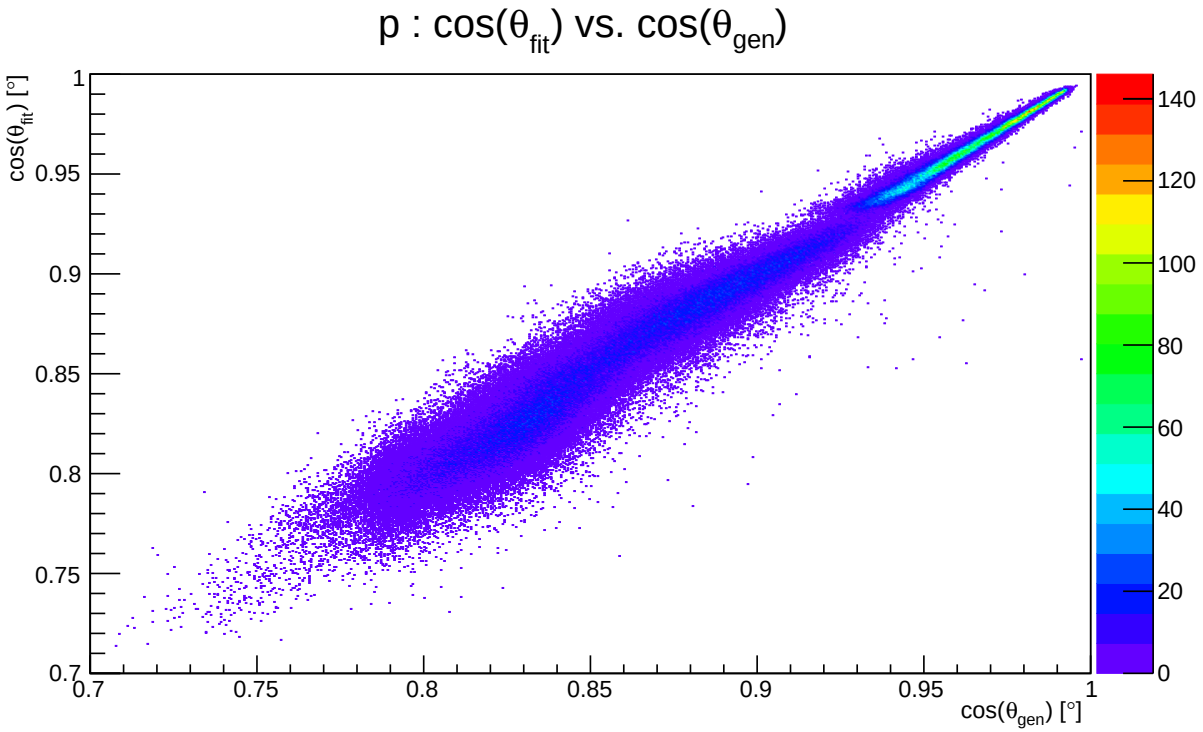

Figure 7: $\cos(\theta_{fit})$ vs. $\cos(\theta_{gen})$ for all protons.

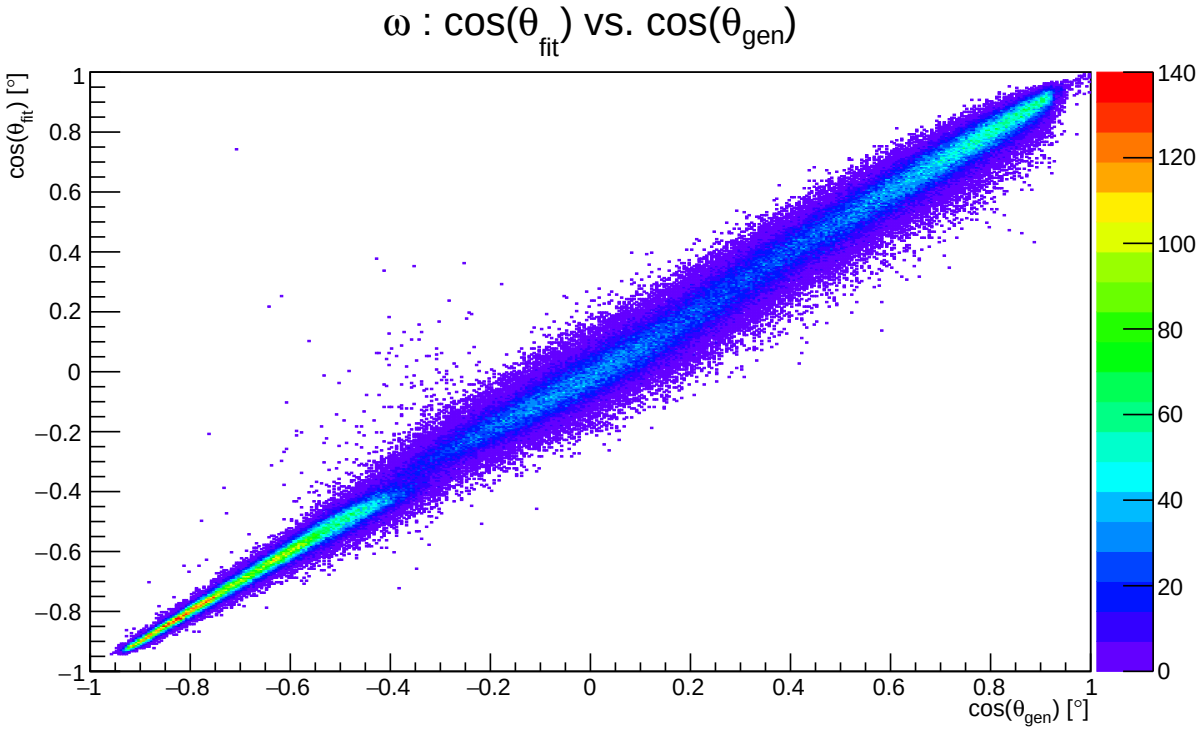

Figure 8: $\cos(\theta_{fit})$ vs. $\cos(\theta_{gen})$ for all ω.

Unfolding

Folded

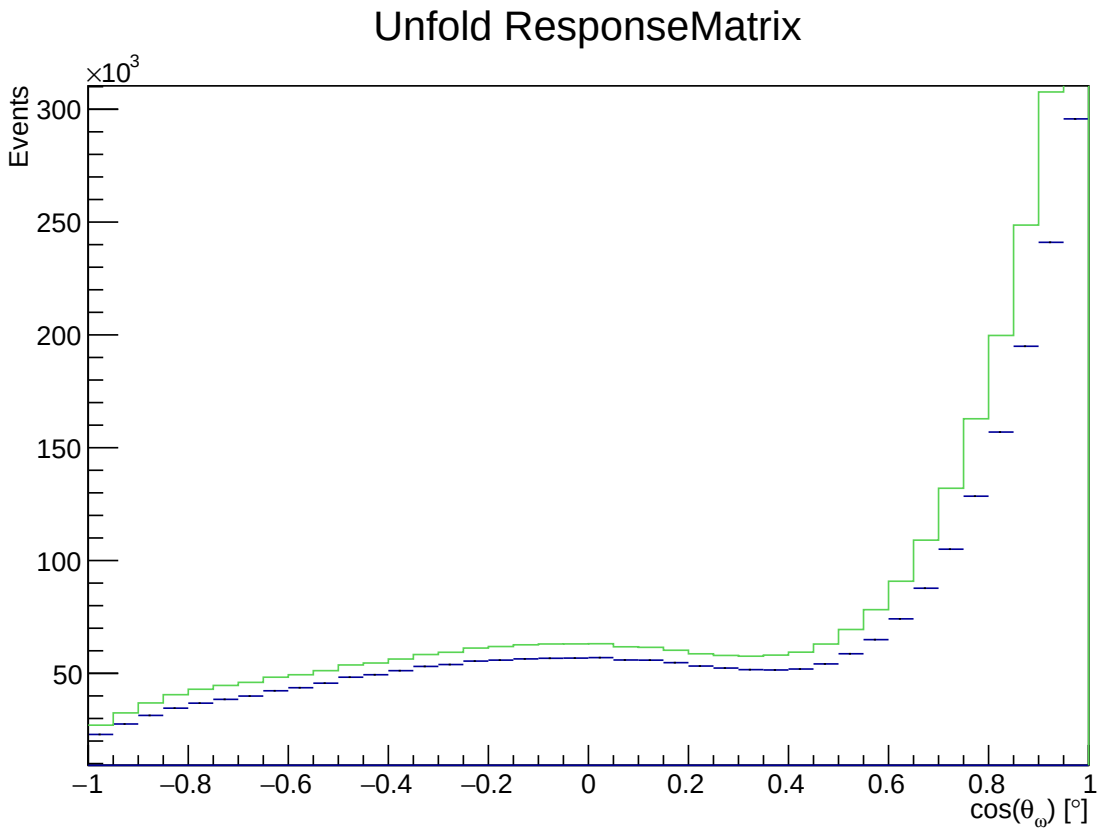

Figure 9: Folded; same cuts

Flat ω

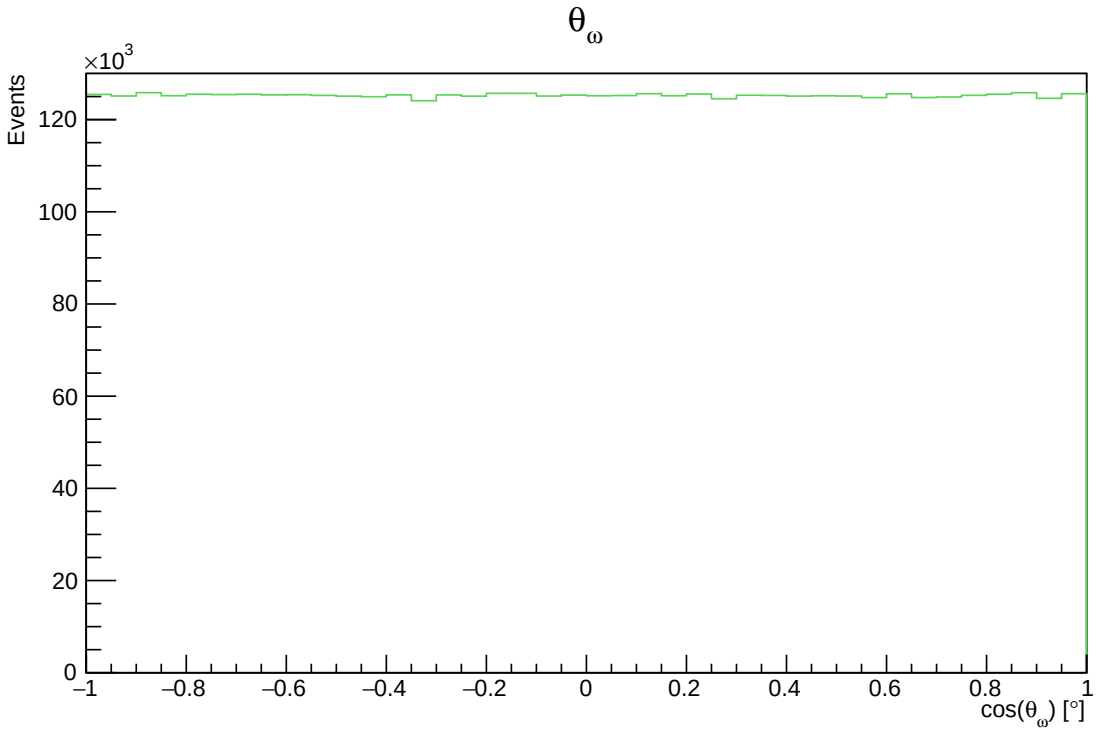

Figure 10: Distribution of the ω in center of mass frame

Flat ω; Folded MC Data

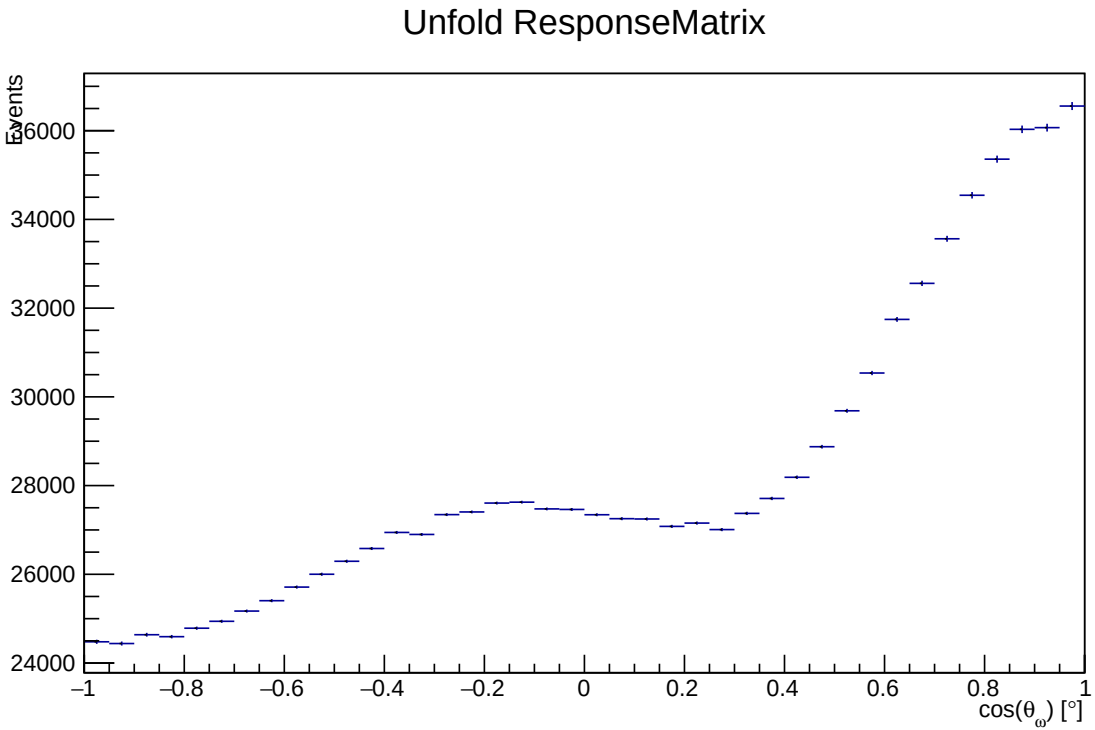

Figure 11: Flat ω was used. MC fitted data were folded.

Flat ω; Folded Beamtime Data