

# Omega Cross-Section

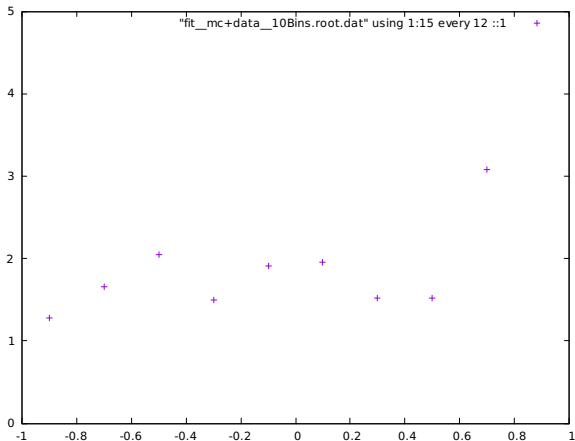
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Martin Sobotzik

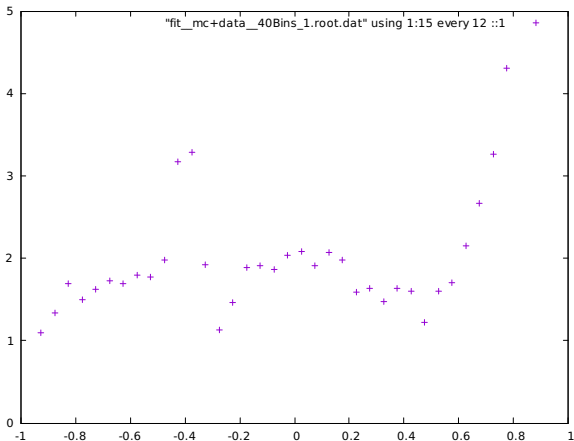
Mainz, October 2018

Institute for Nuclear Physics  
Johannes Gutenberg University of Mainz



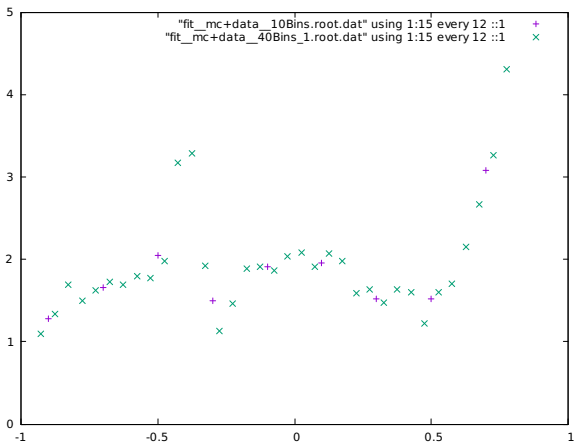


**Figure 1:** Olis Data; Dip at about  $\cos(\theta) = -0.3$

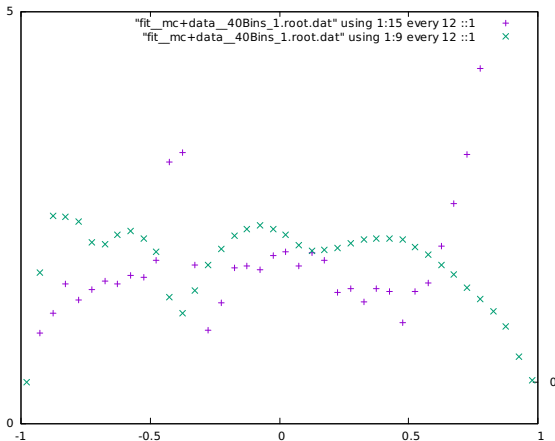


**Figure 2:** Increased number of points; now there is still a dip at  $\cos(\theta) = -0.3$  but also a peak at  $\cos(\theta) = -0.5$

Increased the number of points from 10 to 40



**Figure 3: Overlap**



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

$$\omega \rightarrow \gamma \pi^0 \quad (1)$$

$\downarrow_{\gamma\gamma}$

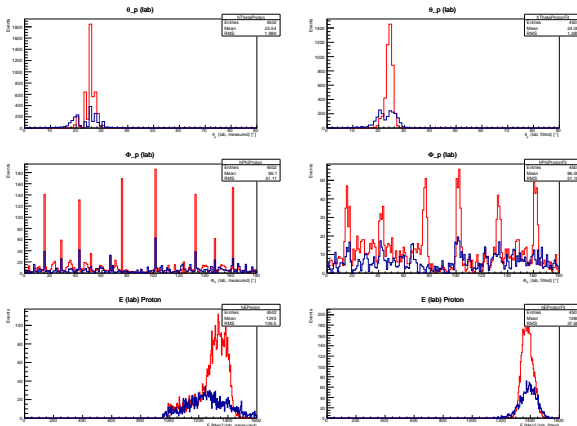
Closer look at:

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

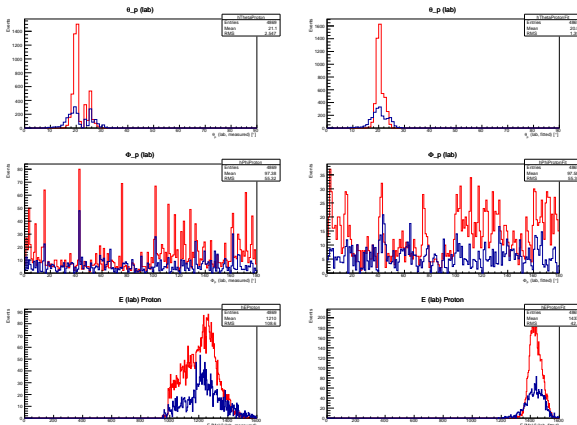
and compare MC with Beamtime Data (both reconstructed)

Used Cuts:

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

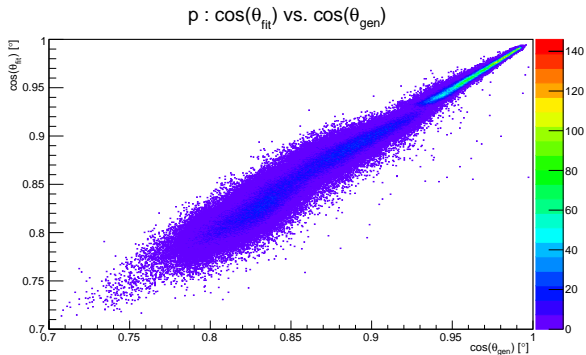


**Figure 5:** Red: MC; Blue Beamtime Data; Protons for  $\cos(\theta_\omega) = [-0.35, -0.25]$ ; Right Side are fitted data



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





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

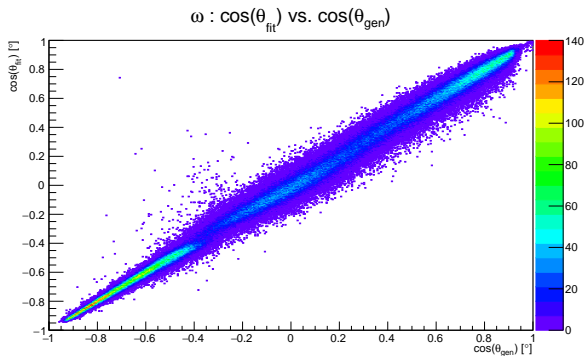
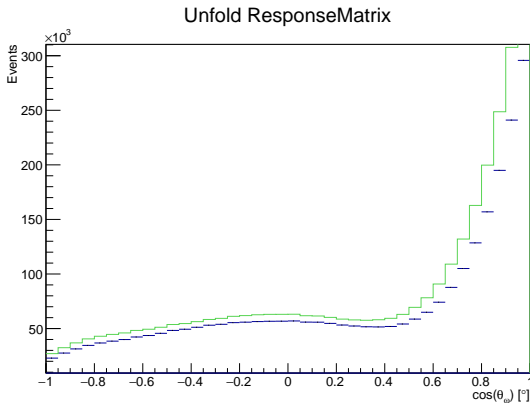


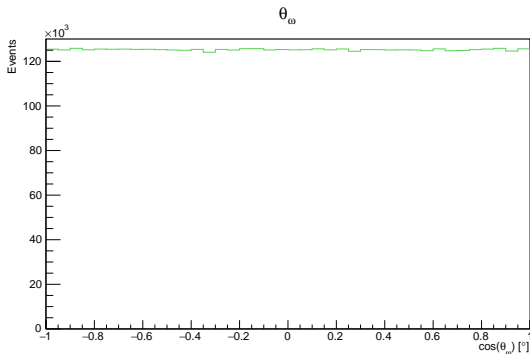
Figure 8:  $\cos(\theta_{fit})$  vs.  $\cos(\theta_{gen})$  for all  $\omega$ .

# Unfolding

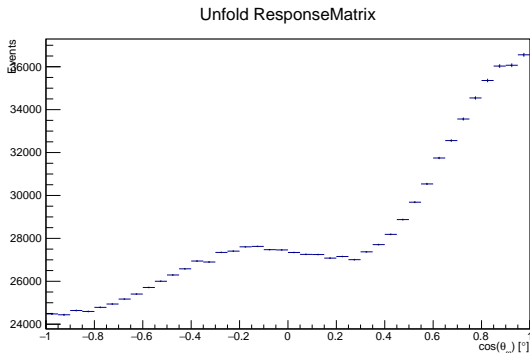




**Figure 9:** Folded; same cuts



**Figure 10:** Distribution of the  $\omega$  in center of mass frame



**Figure 11:** Flat  $\omega$  was used. MC fitted data were folded.

