Efficiency Studies Using ω Decays

12/1/16

Omega Channels

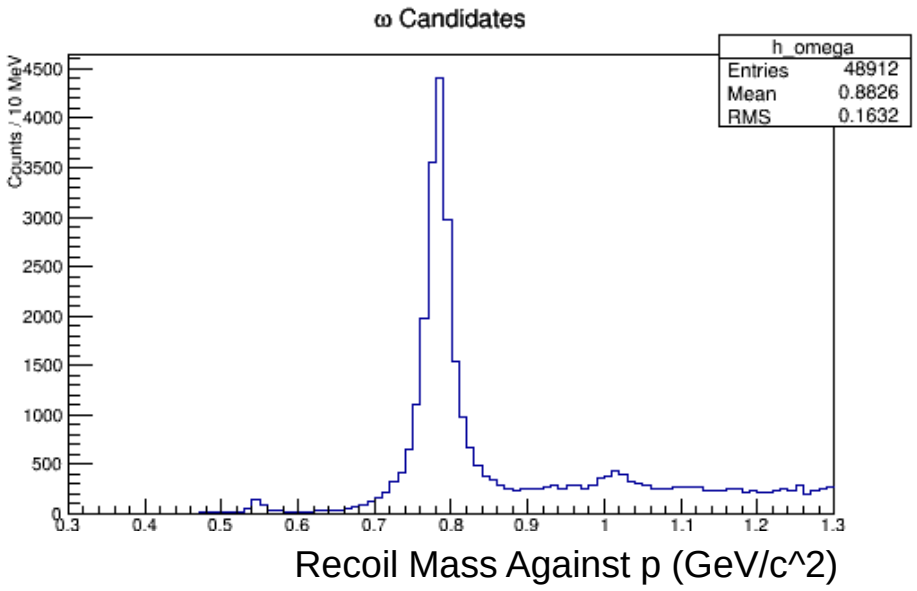
- Top down approach
- Use channel(s) as source of “tagged” photons, study relative efficiencies of MC vs. data
- Two decay channels investigated:
  - $\omega \rightarrow \pi^+\pi^-\pi^0, \pi^0 \rightarrow \gamma(\gamma)$
    - Better purity
    - Most work done here so far
  - $\omega \rightarrow (\gamma)\pi^0$
    - Better coverage at higher E, θ
    - Potential for study of BCAL efficiency?

Event Selection

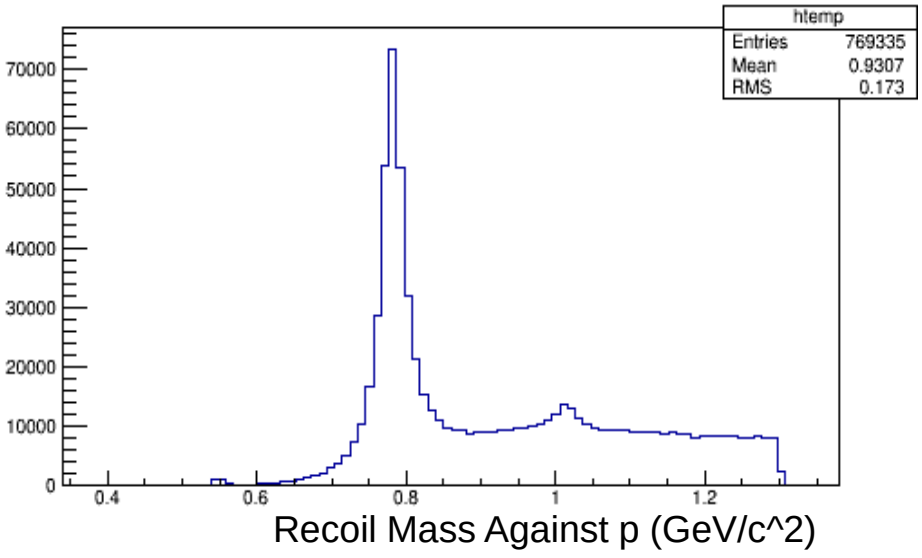
- Standard things:
  - PID timing
  - $\Delta t_{rf} < \frac{1}{2}$ bunch period
  - Z-vertex, DOCA cut on tracks
- Kinematic fitting constraints:
  - Vertex ($\pi^+\pi^-\pi^0$ only)
  - π^0 mass
  - (γ) mass

$\omega \rightarrow \pi^+\pi^-\pi^0, \pi^0 \rightarrow \gamma(\gamma)$

As of 8/22/16



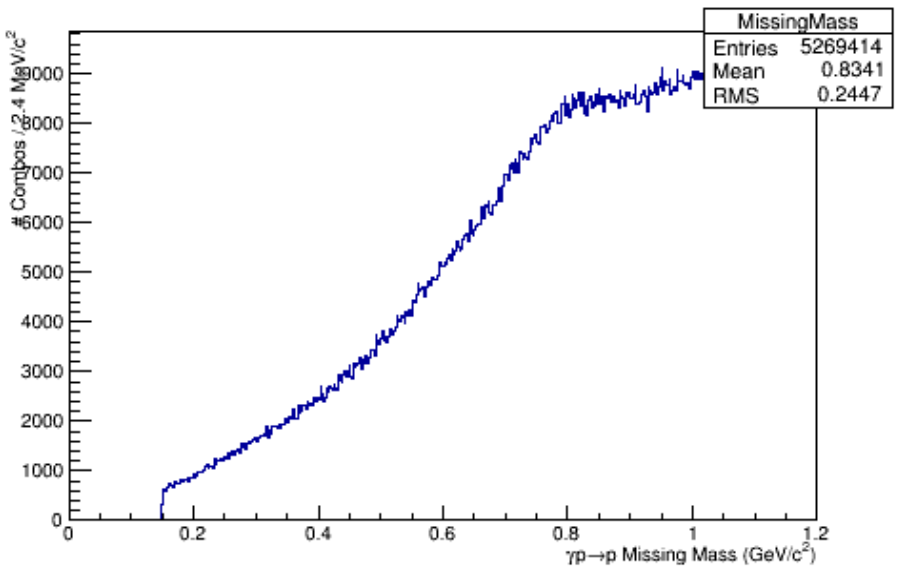
Ver03 REST Data
(most recent)



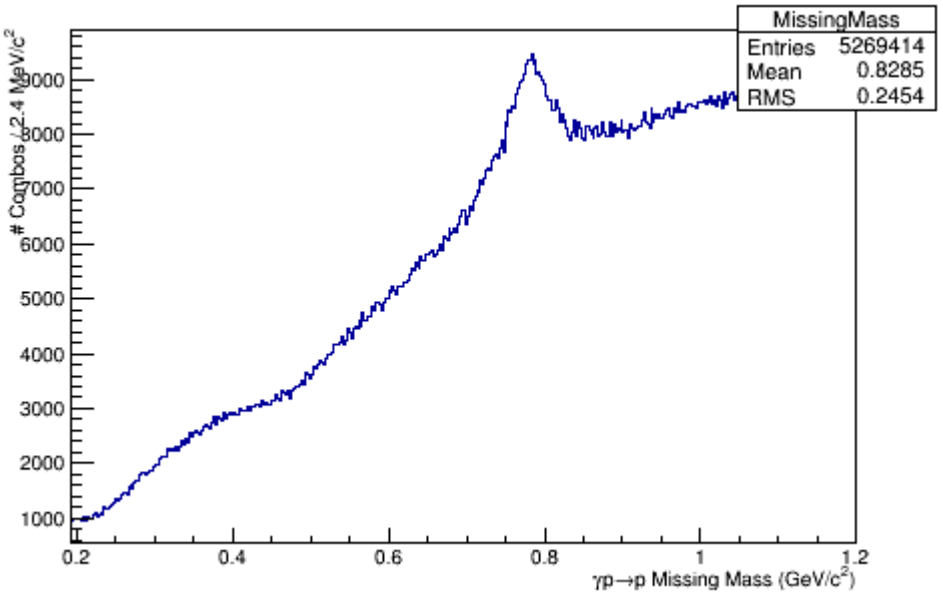
- Higher Statistics, more background now
- Efficiency comparisons to MC coming soon (qualitatively looks same as before)

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

Pre-Kin Fit



Post Kin Fit



- First look: probably could get much better purity
- New error matrices look to be helping a lot!