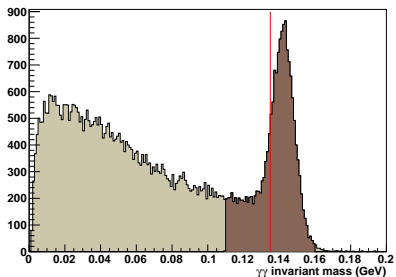
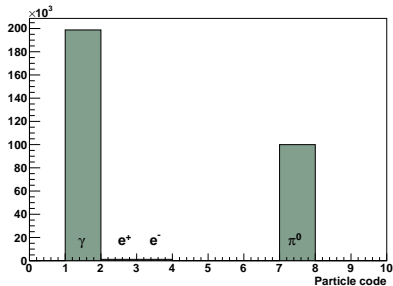


$\pi^0$  acceptance of the GlueX detector, Pb target, 0.028 cm thick,  
 $Z_0=65$  cm, Z-shift=-1 cm

Alexander Mushkarenkov

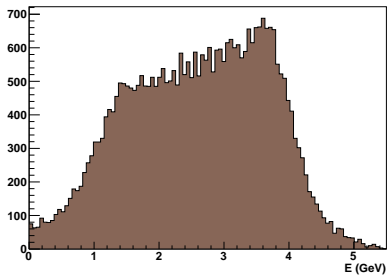
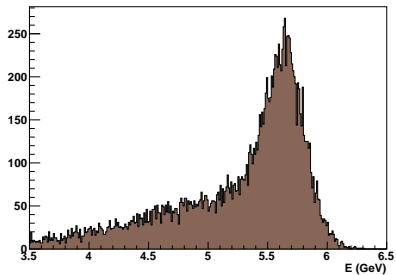
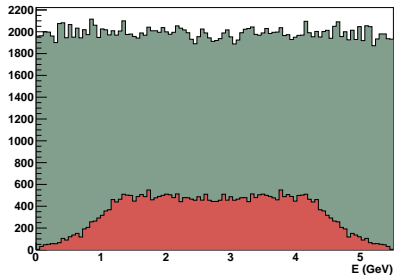
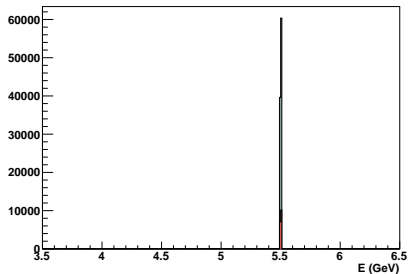
April 4, 2013

# Generated and reconstructed $\pi^0$

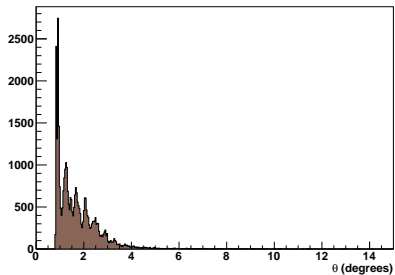
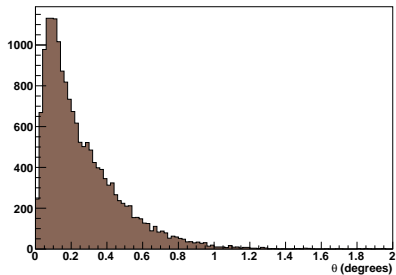
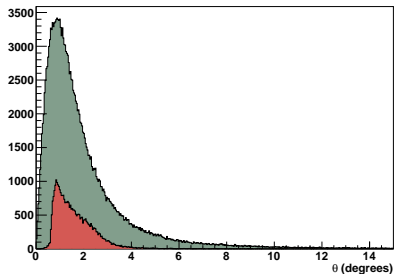
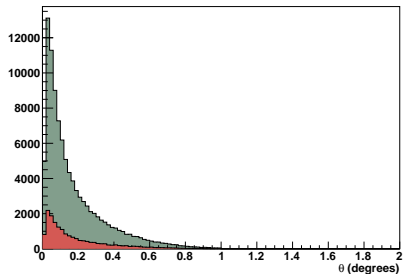


- ▶  $\pi^0 \rightarrow \gamma\gamma \approx 98.8 \%$ ,  $\pi^0 \rightarrow \gamma e^+ e^- \approx 1.17 \%$ ;
- ▶ Pb target, 0.028 cm thick,  $Z_0=65$  cm, Z-shift=-1 cm
- ▶ only the "Gamma" hypotheses were used;
- ▶ if  $> 2$  "Gamma" hypotheses in a event then a pair producing the minimal  $d = |m_{\gamma\gamma} - m_{\pi^0}|$  were selected;
- ▶  $|m_{\gamma\gamma} - m_{\pi^0}| < 0.025$  GeV.

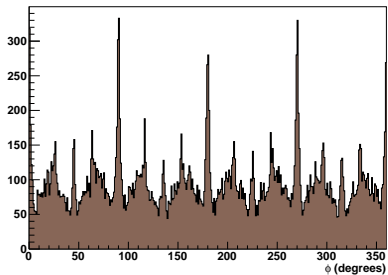
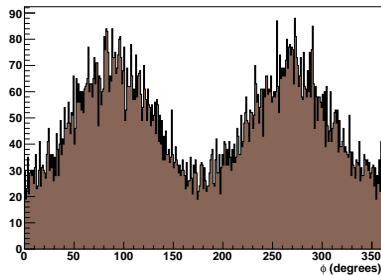
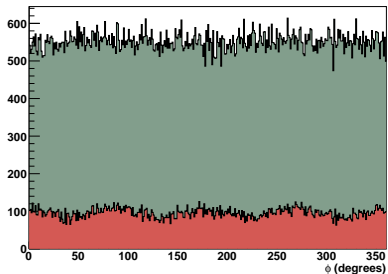
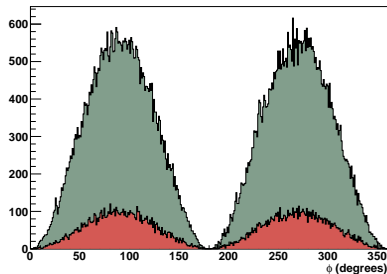
# Generated and reconstructed energy of $\pi^0$ and $\gamma$



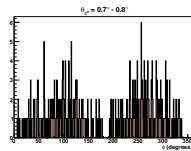
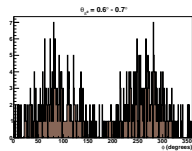
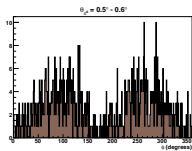
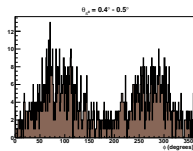
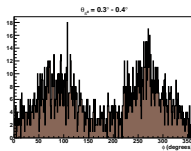
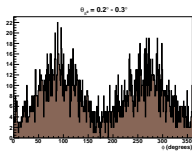
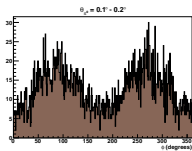
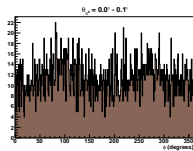
# Generated and reconstructed $\theta$ of $\pi^0$ and $\gamma$



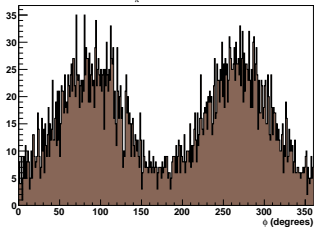
# Generated and reconstructed $\varphi$ of $\pi^0$ and $\gamma$



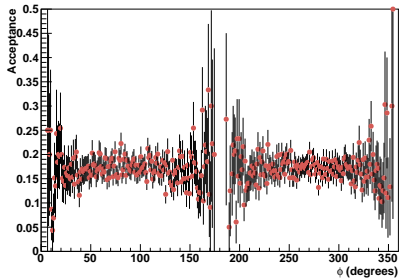
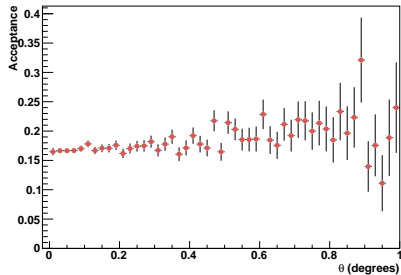
# Reconstructed $\varphi$ vs $\theta$ of $\pi^0$



$\theta_{\pi^0} = 0.3^\circ - 2.0^\circ$



# Acceptance of $\pi^0$



Main source of inefficiency:

- ▶ The central (beam) hole;
- ▶ The detector granularity.