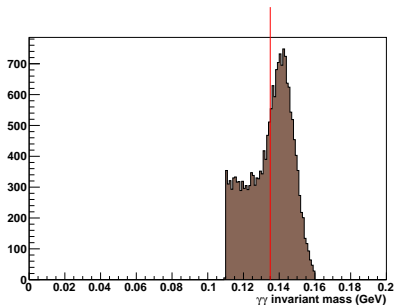
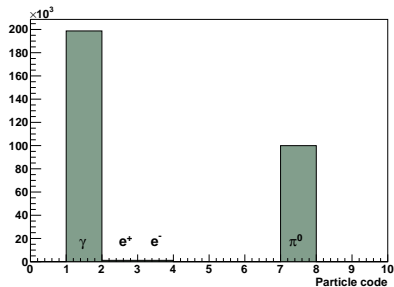


π^0 acceptance of the GlueX detector, Pb target, 0.028cm thick,
100 cm shift.

Alexander Mushkarenkov

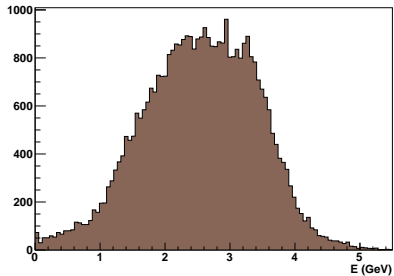
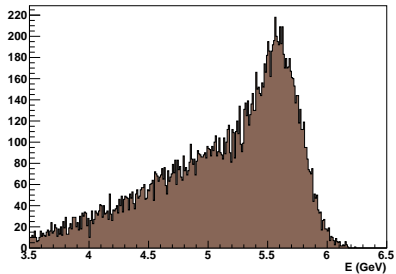
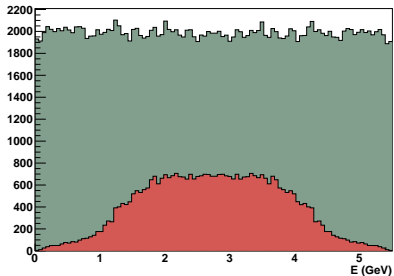
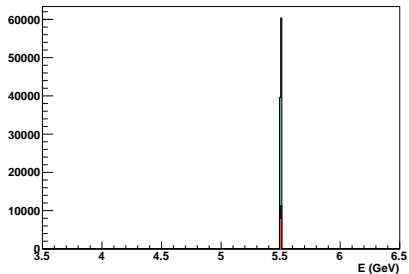
March 28, 2013

Generated and reconstructed π^0

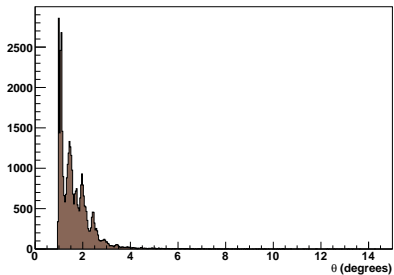
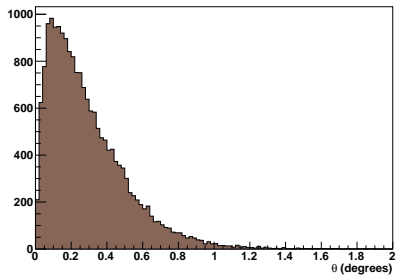
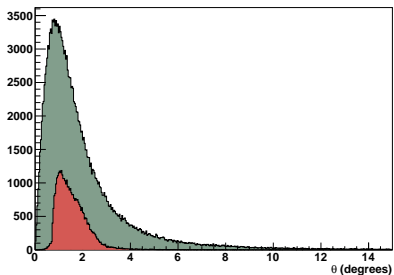
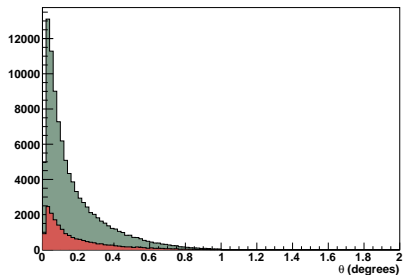


- ▶ $\pi^0 \rightarrow \gamma\gamma \approx 98.8 \%$, $\pi^0 \rightarrow \gamma e^+ e^- \approx 1.17 \%$;
- ▶ "default" target;
- ▶ only the "Gamma" hypotheses were used;
- ▶ if > 2 "Gamma" hypotheses in a event then a pair producing the minimal $d = |m_{\gamma\gamma} - m_{\pi^0}|$ were selected;
- ▶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

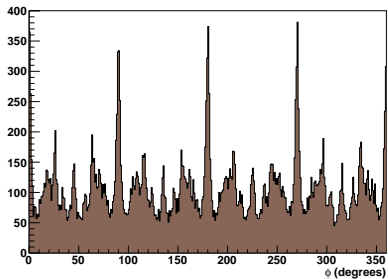
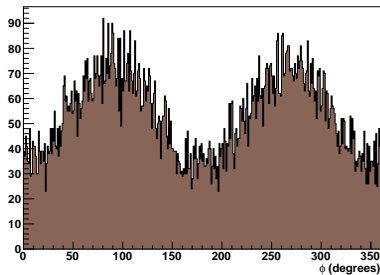
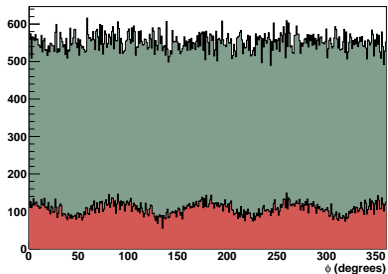
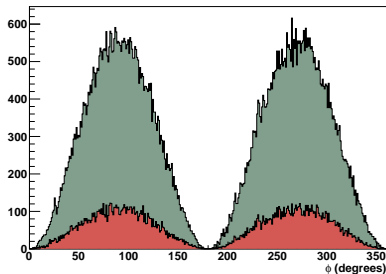
Generated and reconstructed energy of π^0 and γ



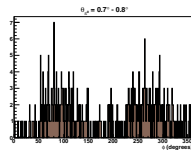
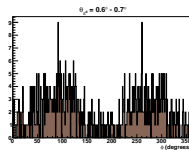
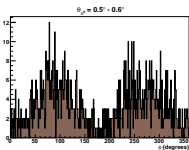
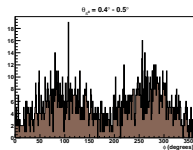
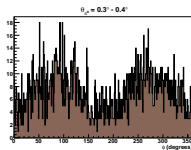
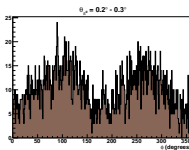
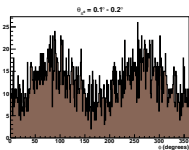
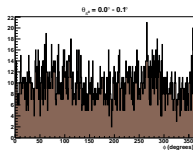
Generated and reconstructed θ of π^0 and γ



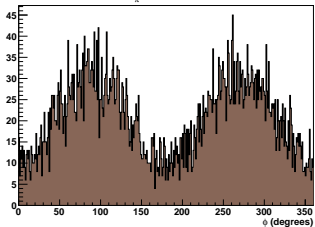
Generated and reconstructed φ of π^0 and γ



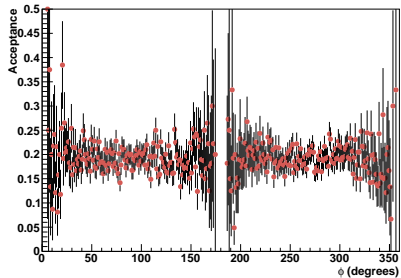
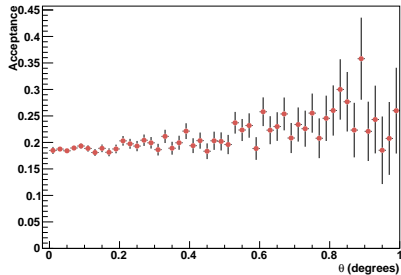
Reconstructed φ vs θ of π^0



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



Acceptance of π^0



Main source of inefficiency:

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