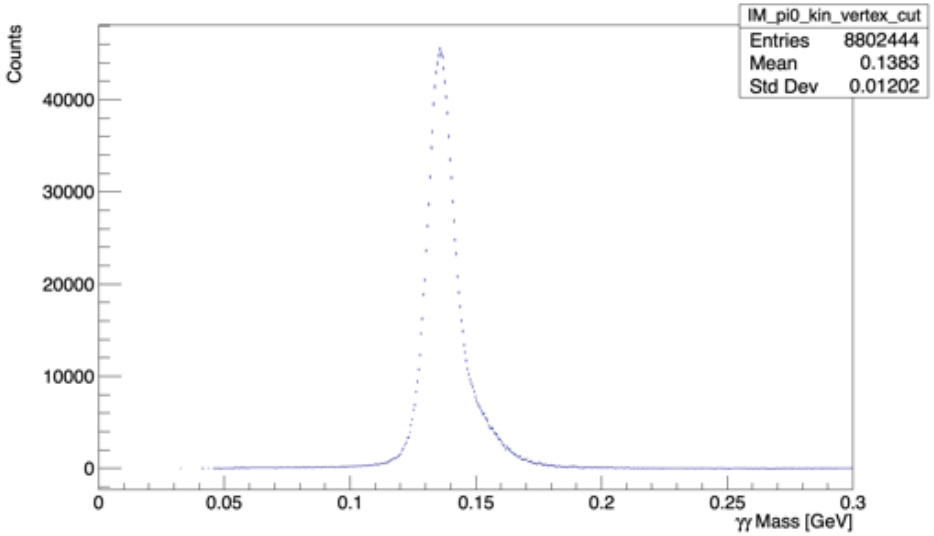
η/π^0 Analysis Update

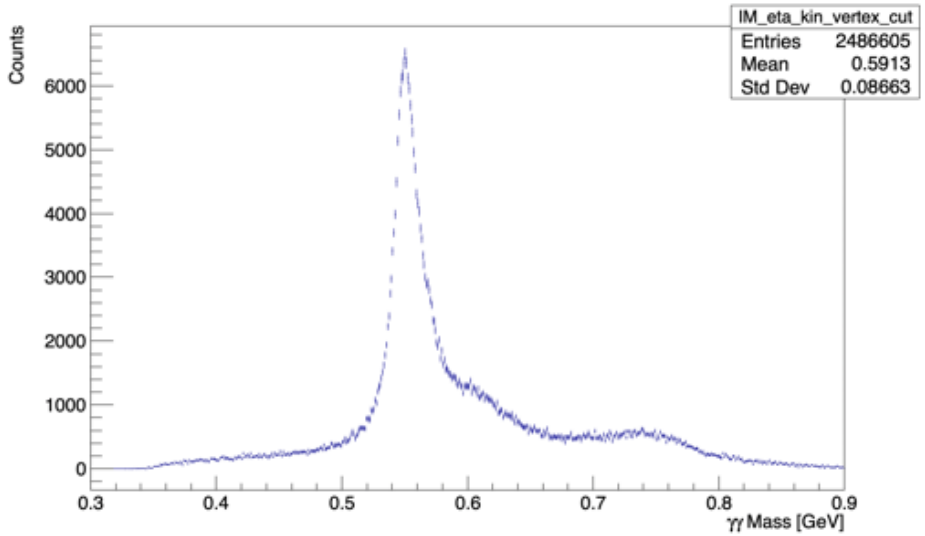
Tim Kolar - SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



First Cuts

♥ $\text{PIDFOM}_{\text{proton}} > 0.05$

♥ $E_{\text{unused showers}} = 0$

♥ $\#_{\text{Extra tracks}} = 0$

♥ $E_\gamma > 6\,\text{GeV}$

♥ Vertex Cuts (z, $x\&y$)

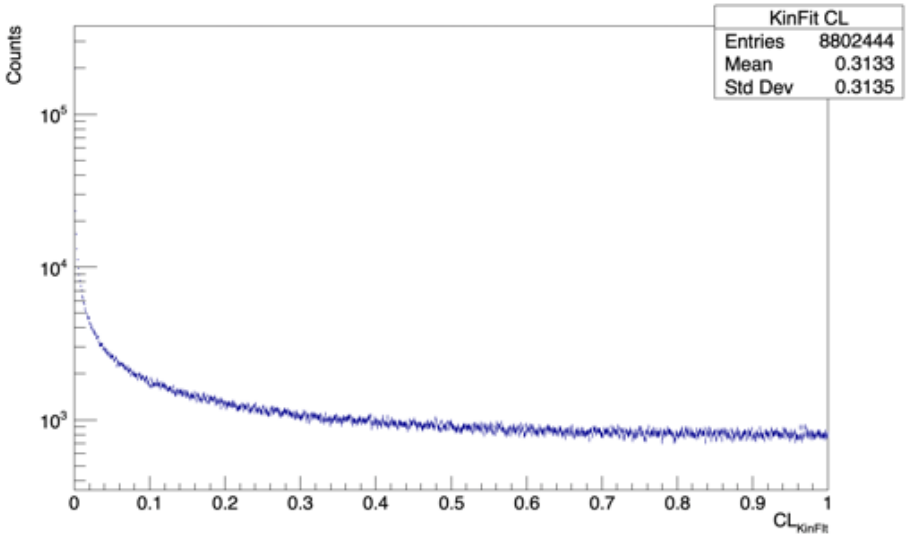
♥ CL > 0.02

η/π^0 Analysis Update

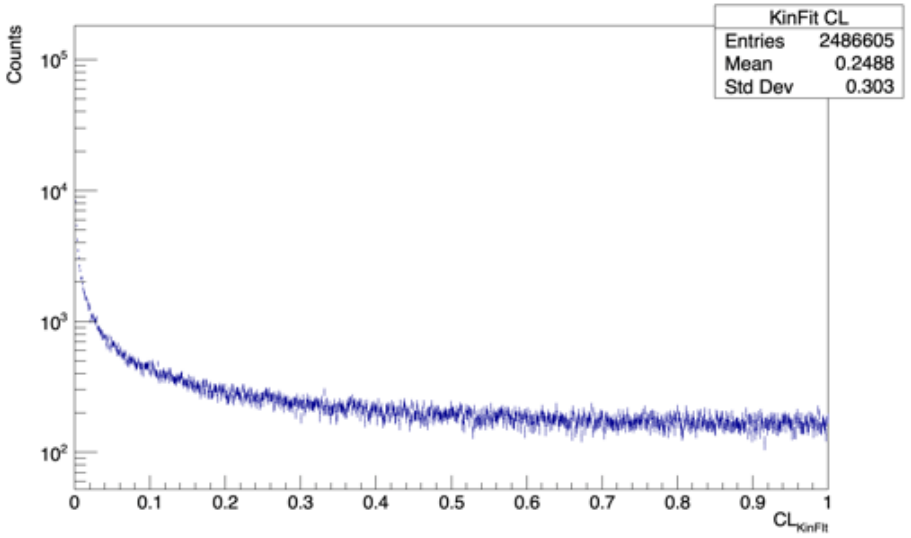
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



First Cuts

♥ $\text{PIDFOM}_{\text{proton}} > 0.05$

♥ $E_{\text{unused showers}} = 0$

♥ $\#_{\text{Extra tracks}} = 0$

♥ $E_\gamma > 6\,\text{GeV}$

♥ Vertex Cuts (z, $x\&y$)

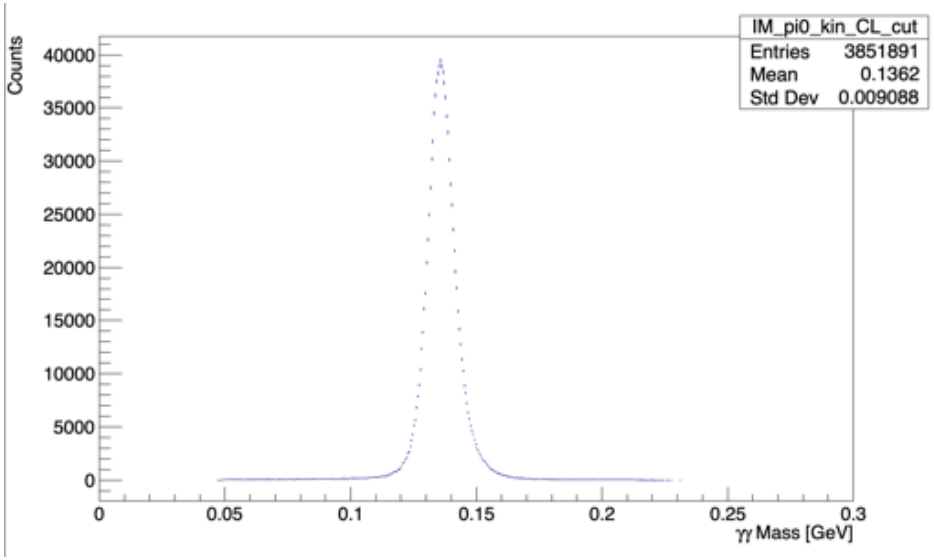
♥ CL > 0.02

η/π^0 Analysis Update

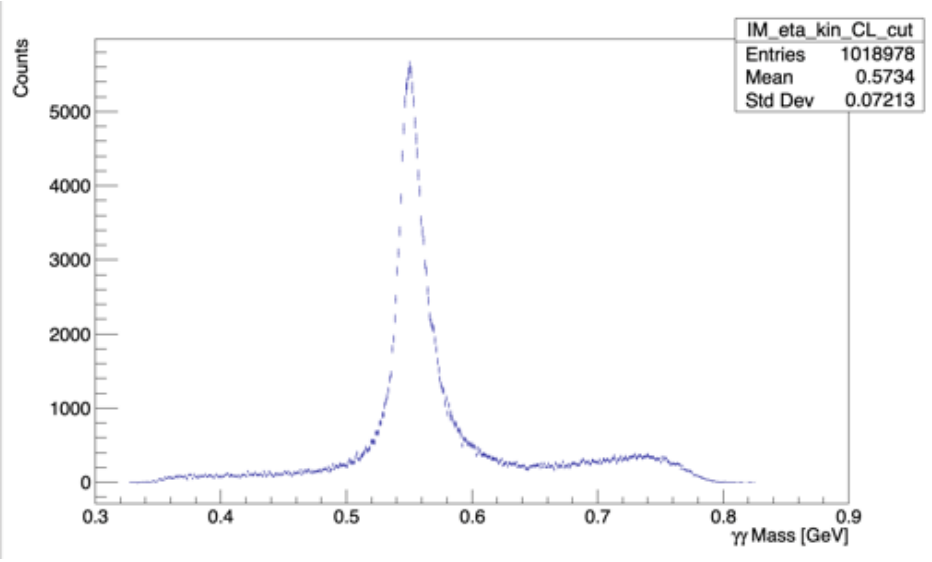
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



First Cuts

♥ $\text{PIDFOM}_{\text{proton}} > 0.05$

♥ $E_{\text{unused showers}} = 0$

♥ $\#_{\text{Extra tracks}} = 0$

♥ $E_\gamma > 6\,\text{GeV}$

♥ Vertex Cuts (z, $x\&y$)

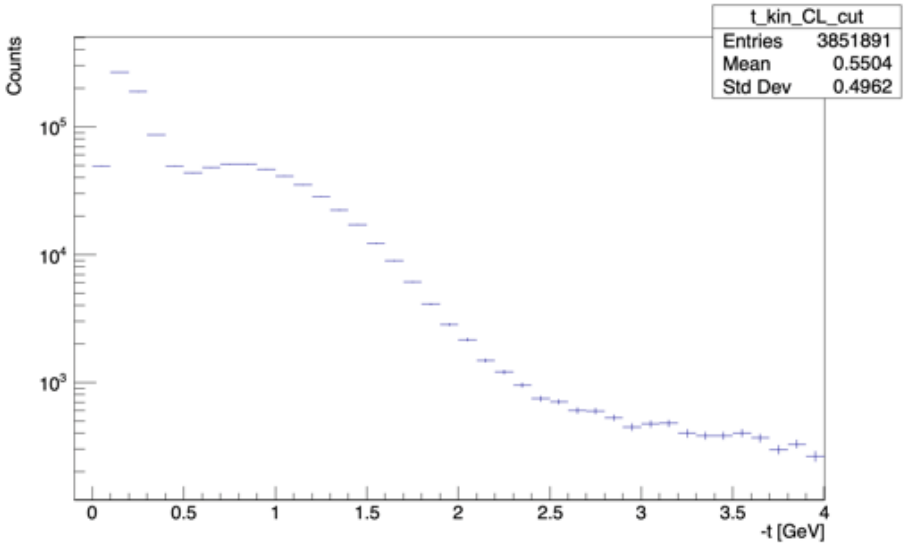
♥ CL > 0.02

η/π^0 Analysis Update

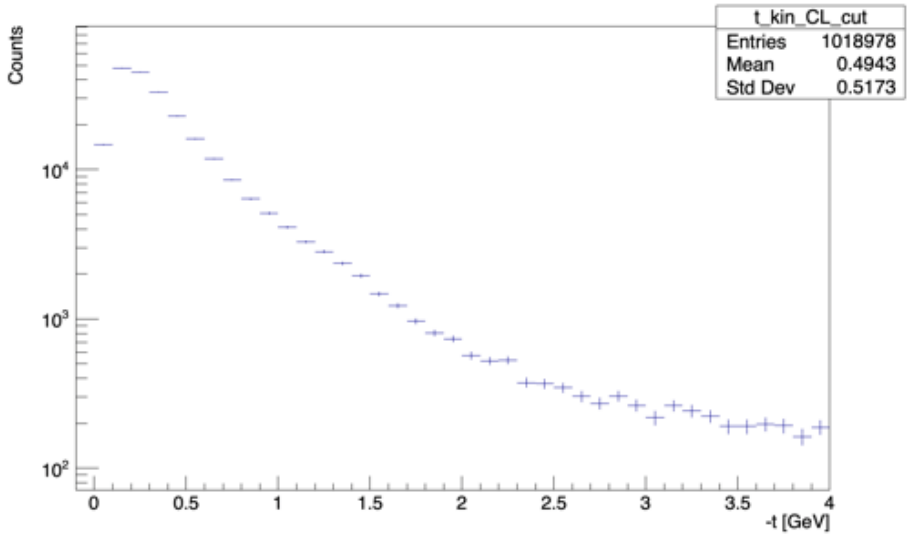
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



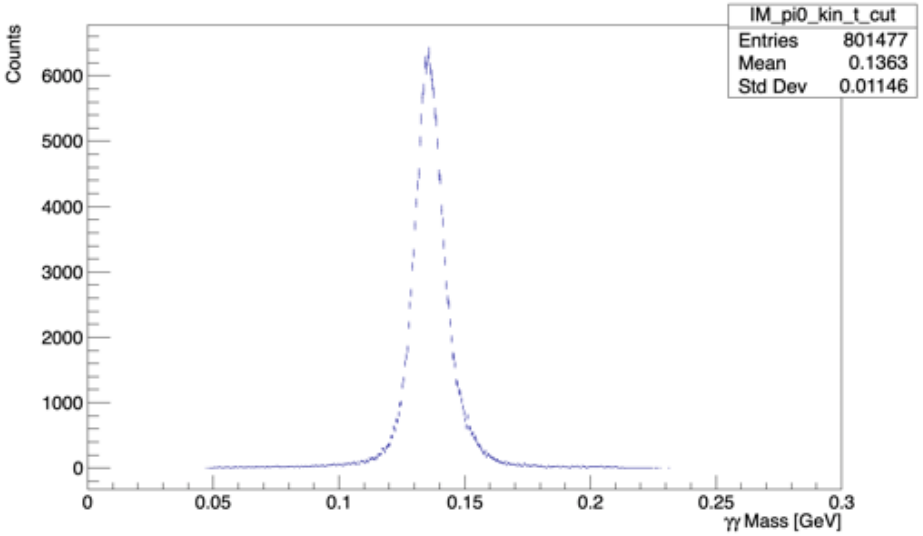
♥ $|t| > 1\,\mathrm{GeV}$

η/π^0 Analysis Update

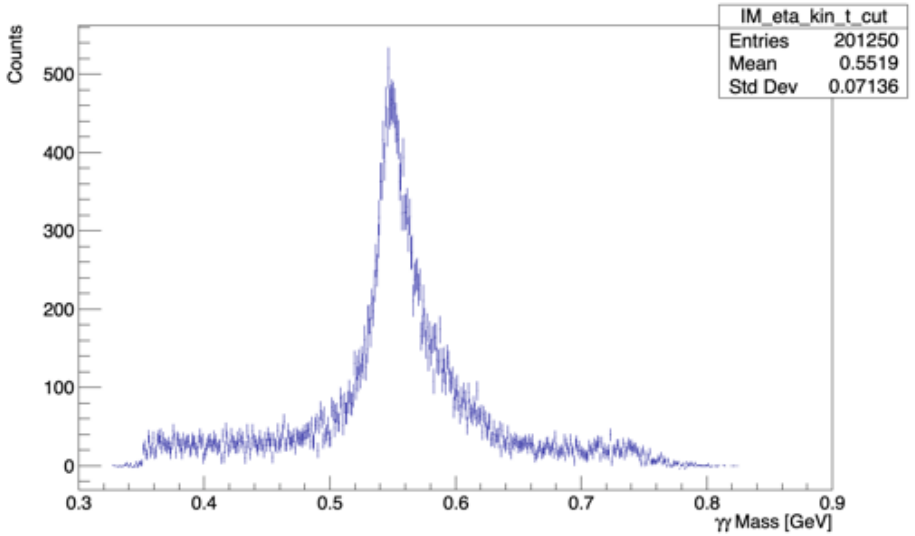
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



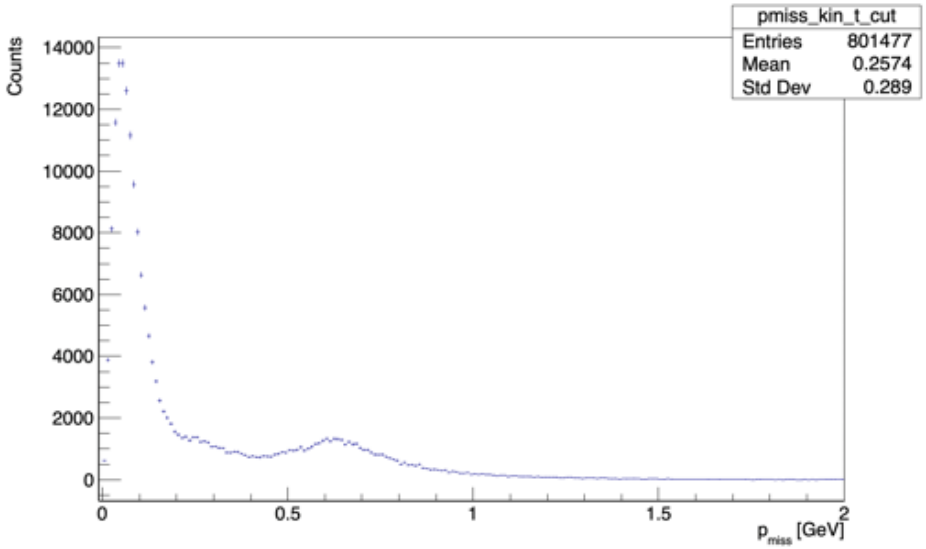
♥ $|t| > 1\,\mathrm{GeV}$

η/π^0 Analysis Update

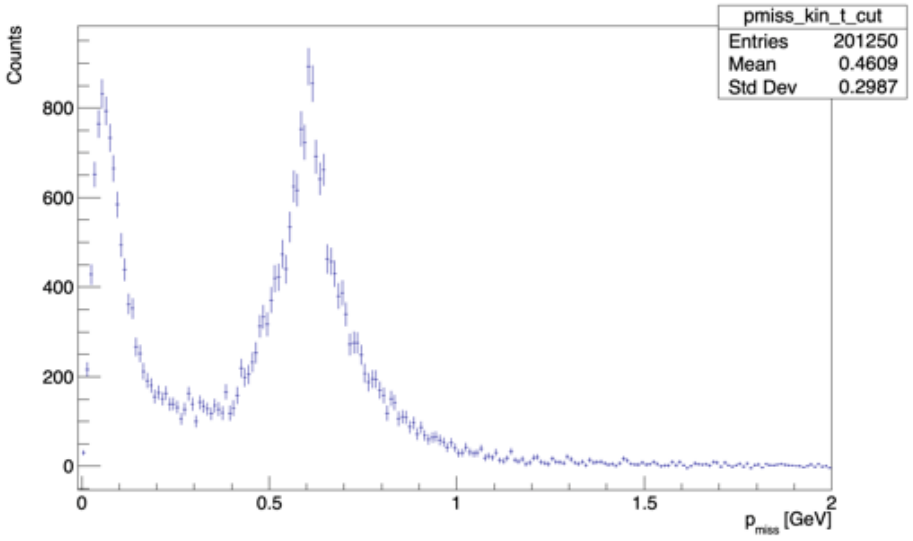
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



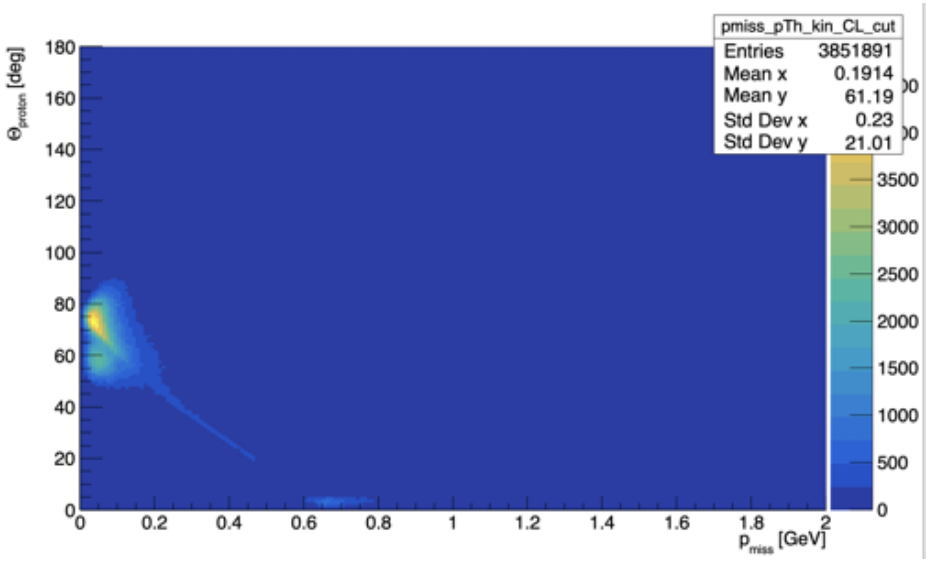
♥ $|t| > 1\,\mathrm{GeV}$

η/π^0 Analysis Update

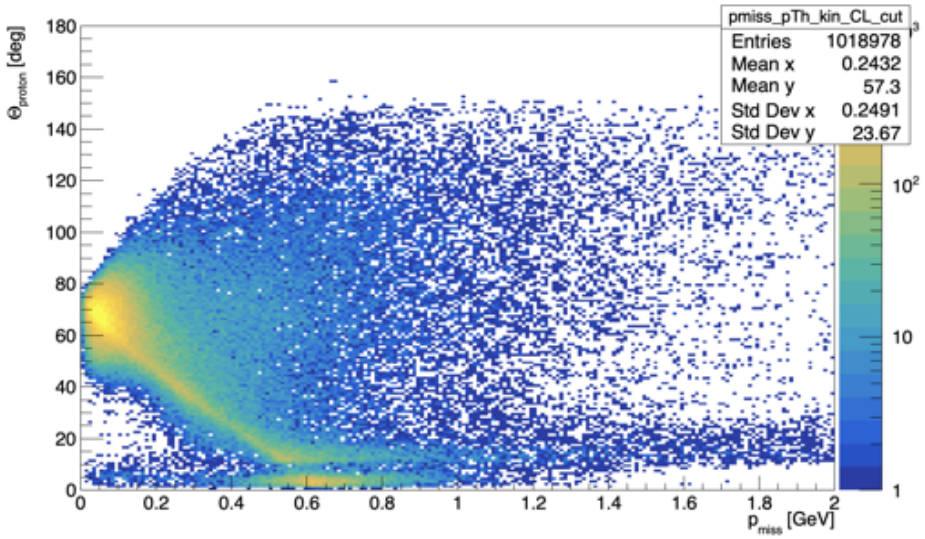
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



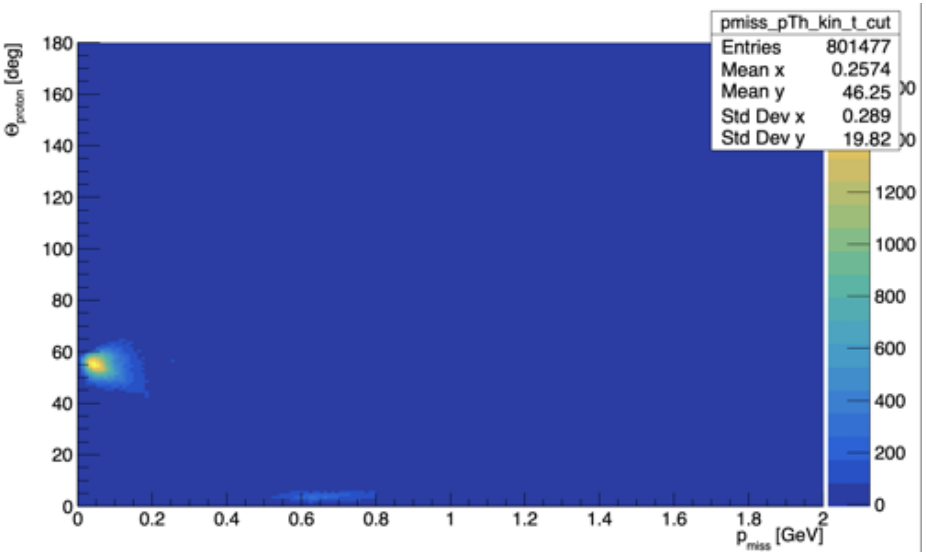
♥ $|t| > 1\,\mathrm{GeV}$

η/π^0 Analysis Update

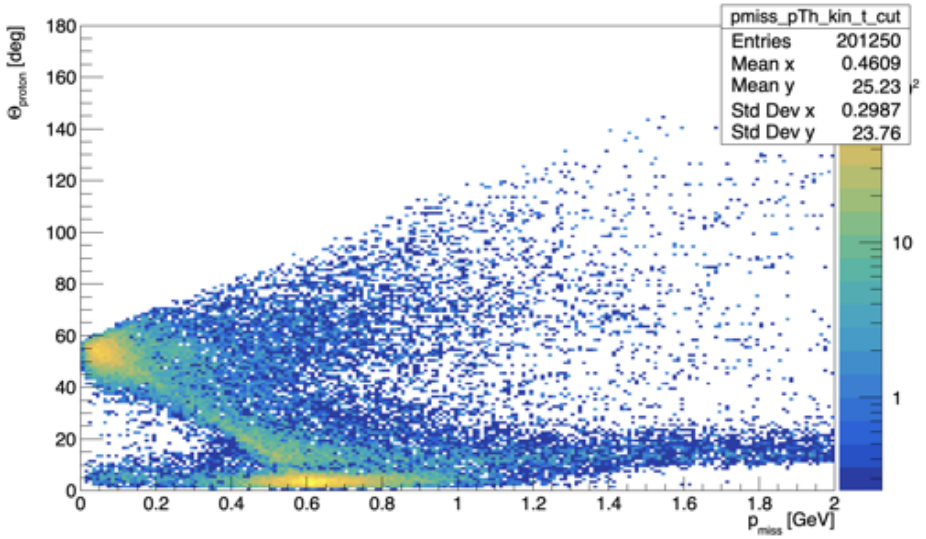
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



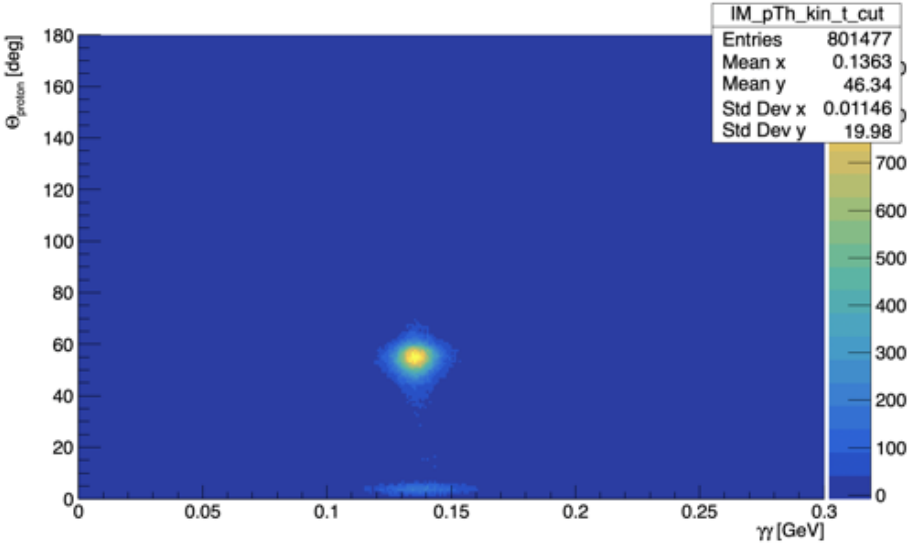
♥ $|t| > 1\,\mathrm{GeV}$

η/π^0 Analysis Update

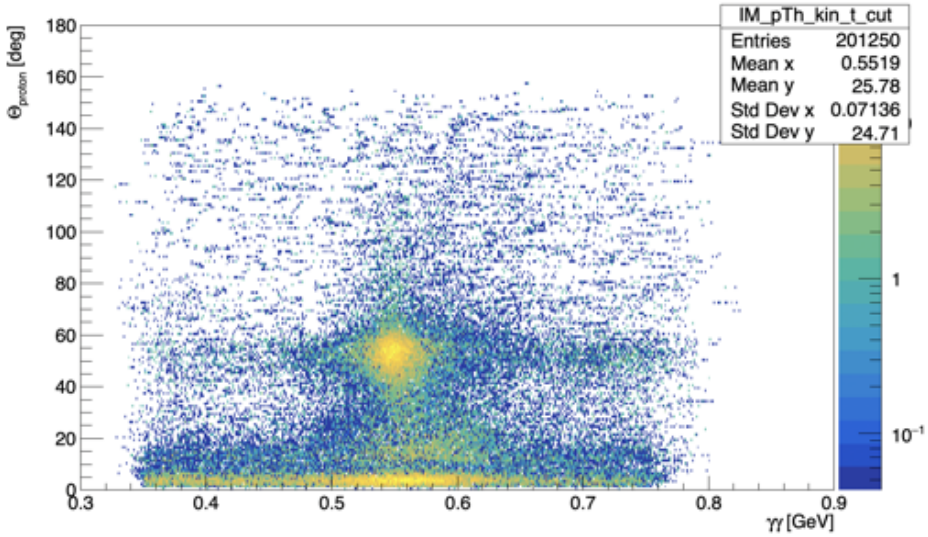
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



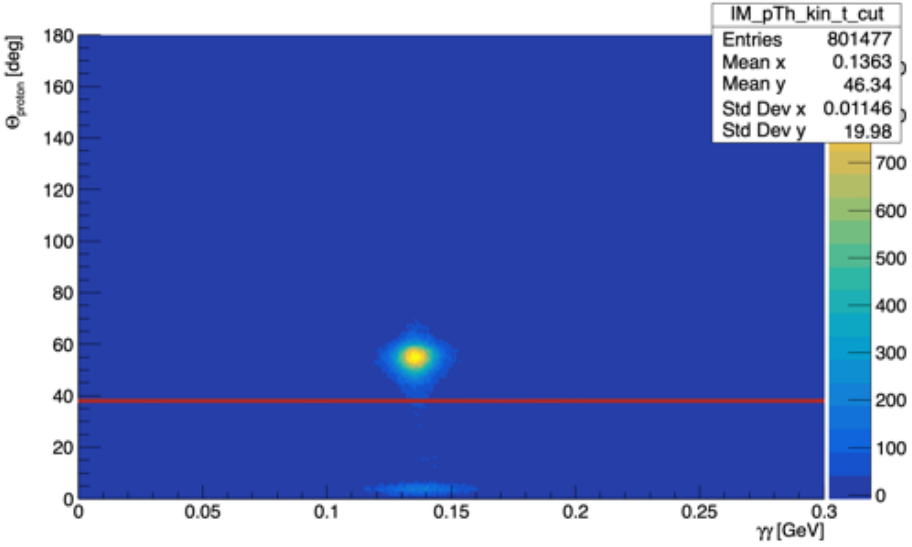
♥ $|t| > 1\,\mathrm{GeV}$

η/π^0 Analysis Update

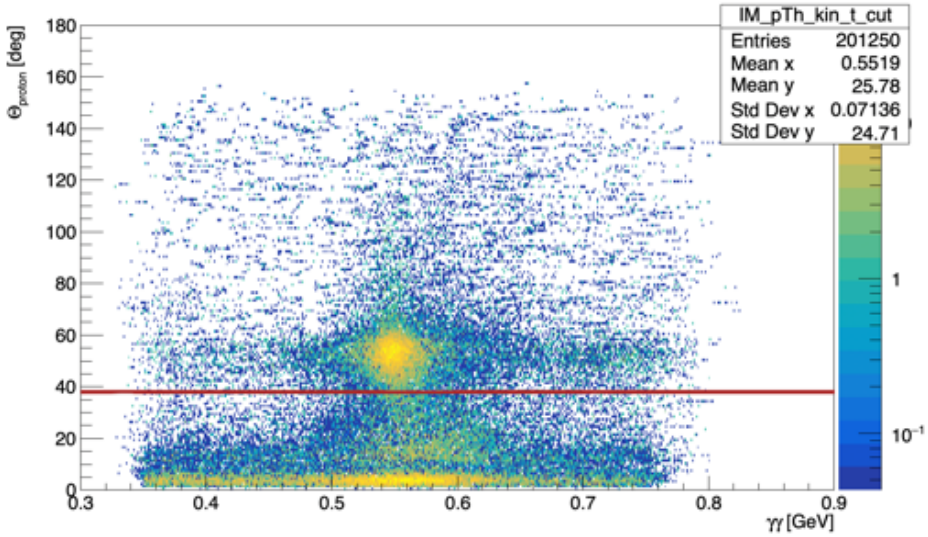
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



♥ $|t| > 1\,\mathrm{GeV}$

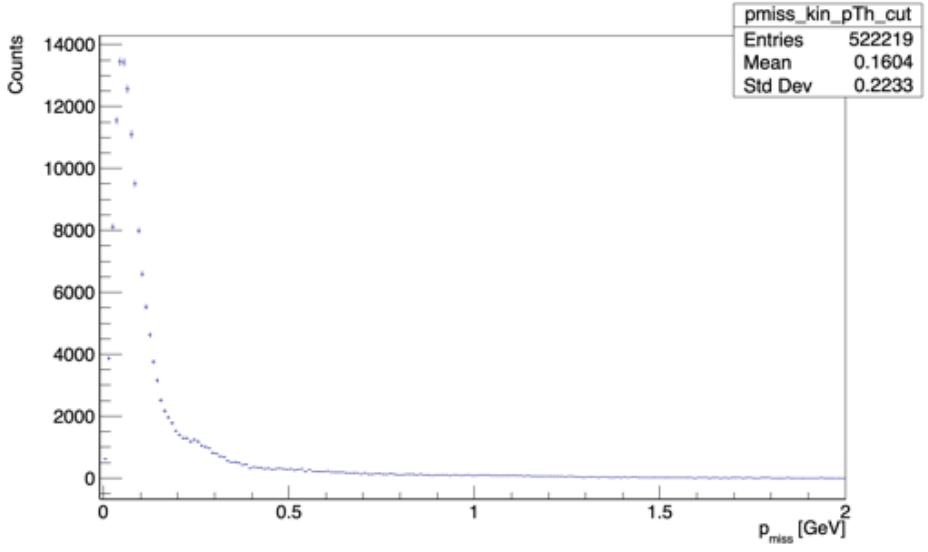
♥ $\theta_{\mathrm{proton}} > 38°$

η/π^0 Analysis Update

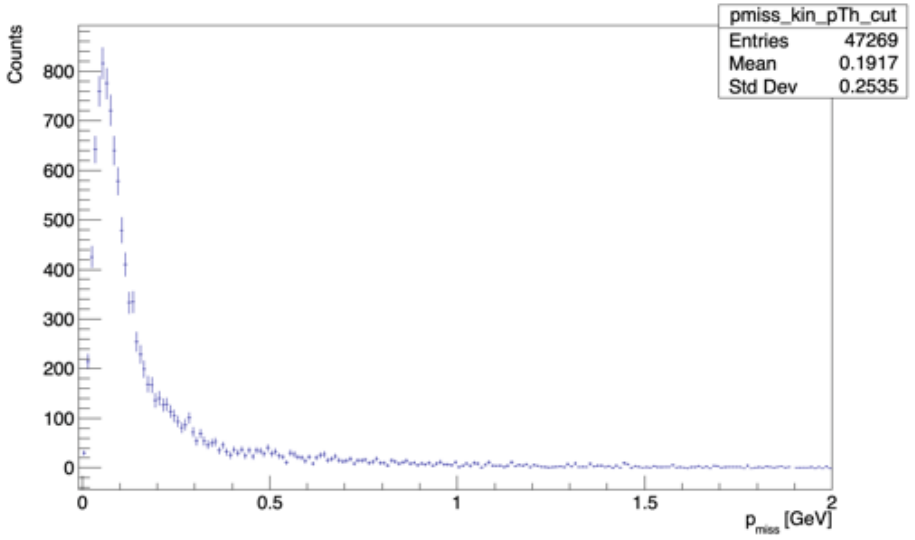
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



♥ $|t| > 1\,\mathrm{GeV}$

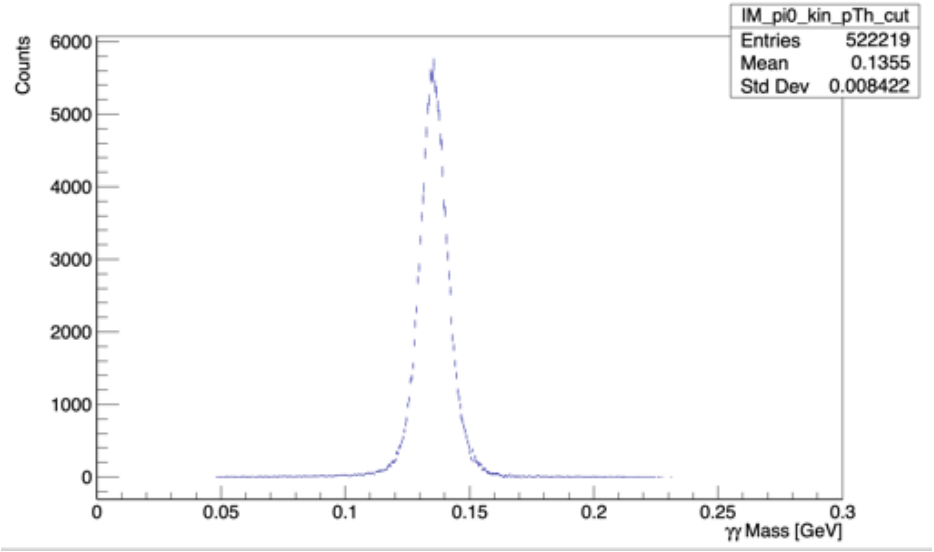
♥ $\theta_{\mathrm{proton}} > 38°$

η/π^0 Analysis Update

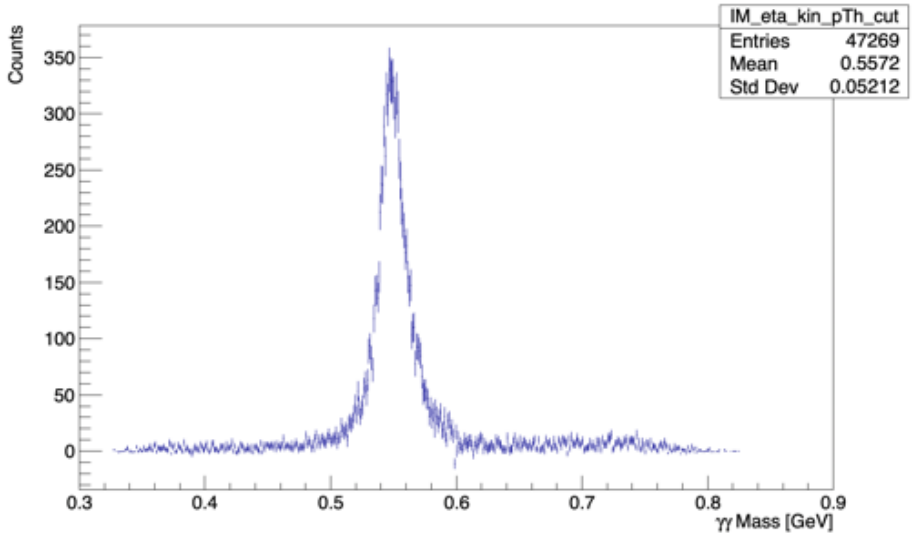
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$



✘ $\gamma + D \to \eta + p + m(n)$



♥ $|t| > 1\,\mathrm{GeV}$

♥ $\theta_{\mathrm{proton}} > 38°$

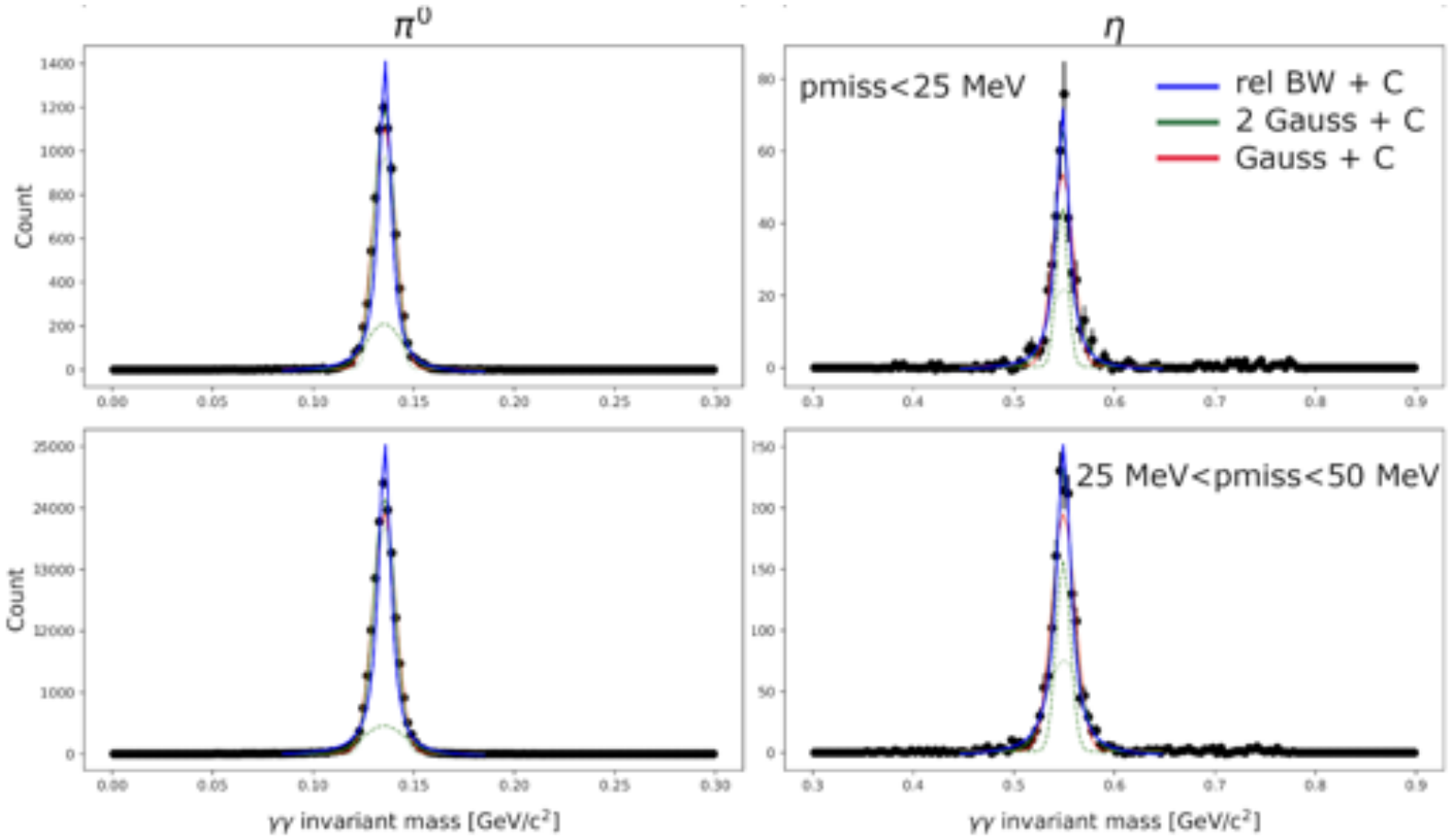
η/π^0 Analysis Update

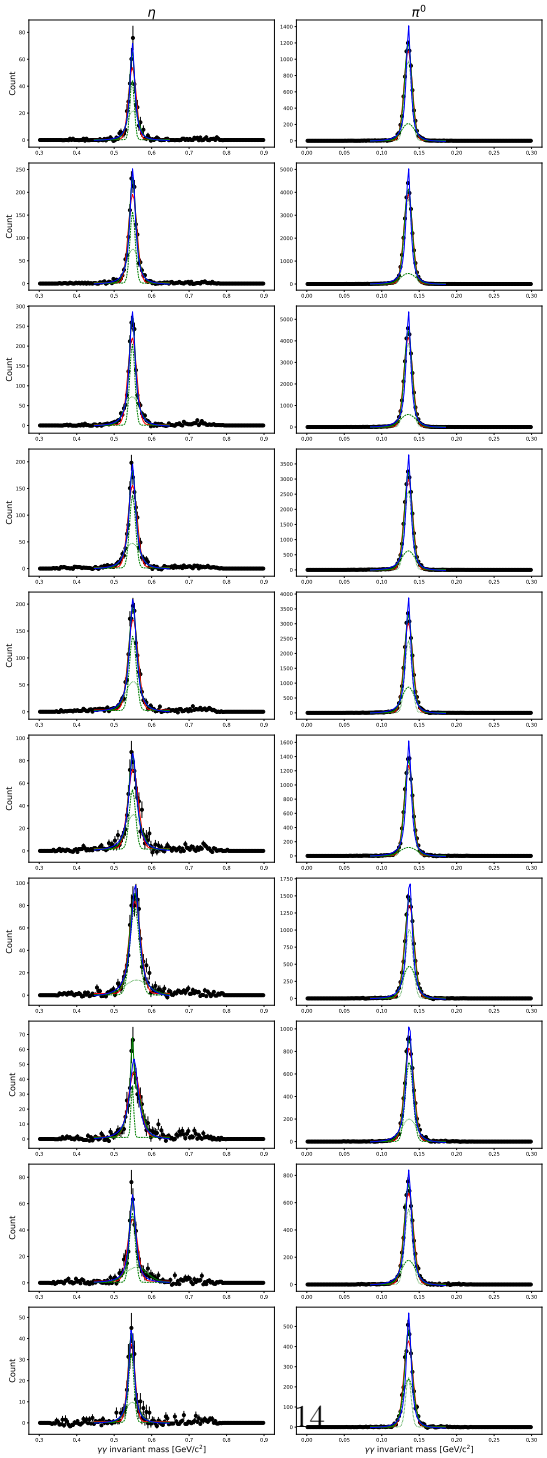
SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$

✘ $\gamma + D \to \eta + p + m(n)$




η
π0
Count
γγ invariant mass [GeV/c²]

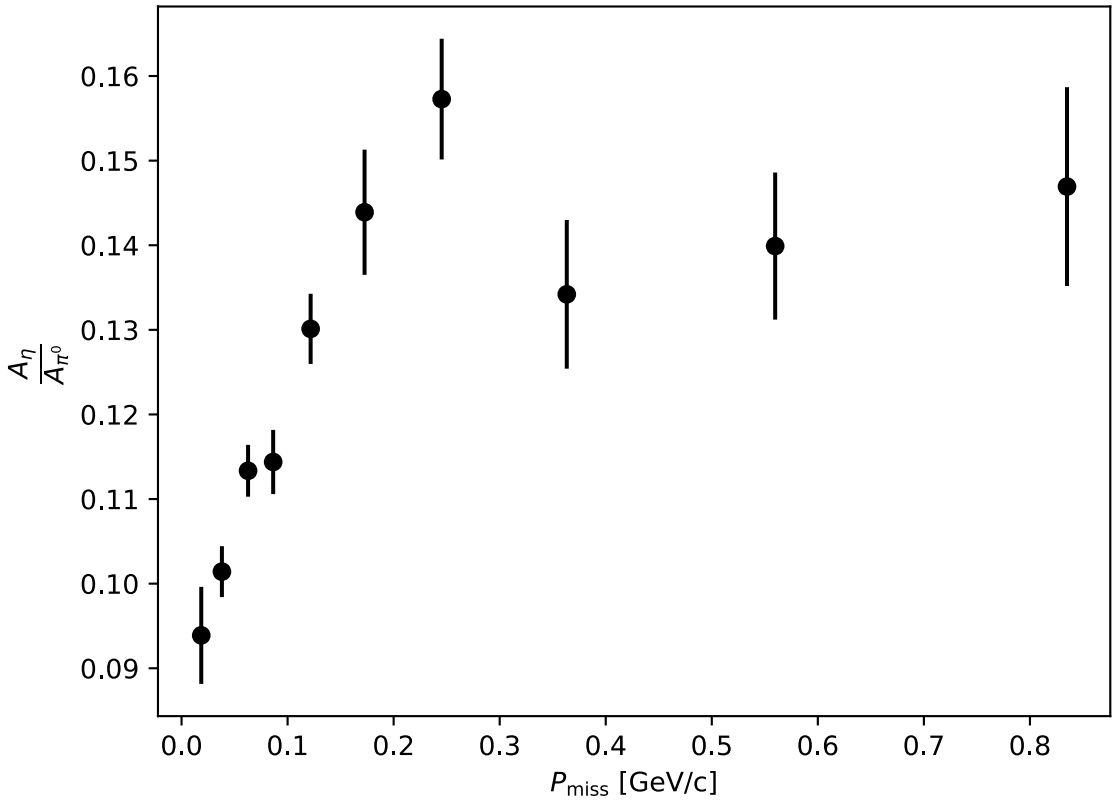
η/π^0 Analysis Update

SRC/CT@GlueX - 5 Dec 2022

Reactions

✘ $\gamma + D \to \pi^0 + p + m(n)$

✘ $\gamma + D \to \eta + p + m(n)$

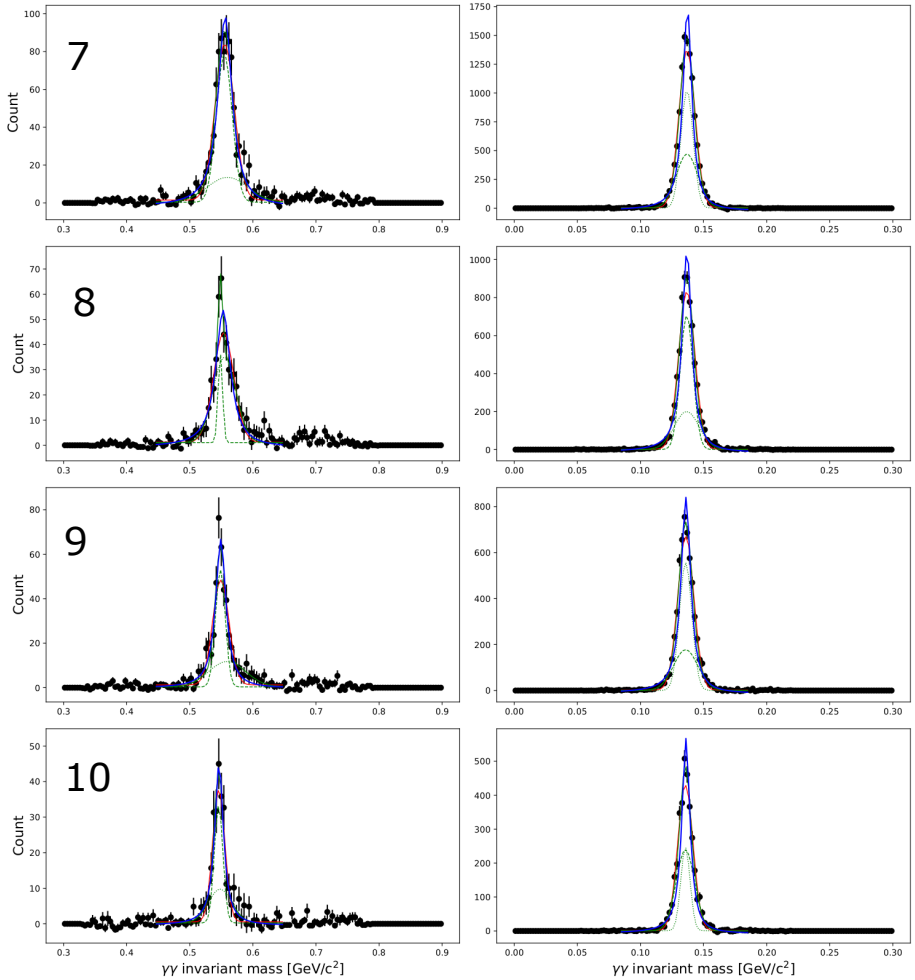


η/π^0 Analysis Update

SRC/CT@GlueX - 5 Dec 2022

✘ $\gamma + D \to \pi^0 + p + m(n)$

✘ $\gamma + D \to \eta + p + m(n)$



η/π^0 Analysis Update

Next Steps:

- ✘ Simulation
  - Try to capture phase-space effects for the two reactions
  - Need η DCS that goes to $3\,\text{GeV} < W < 5\,\text{GeV}$, $|t| < 3\,\text{GeV}$
- ✘ Try to further clean the data
- ✘ Improve fitting procedure