

Measurements of $\eta^{(\prime)}$
Transition Form Factor
from $\gamma p \rightarrow \eta (-\rightarrow e^+ e^- \gamma) p$

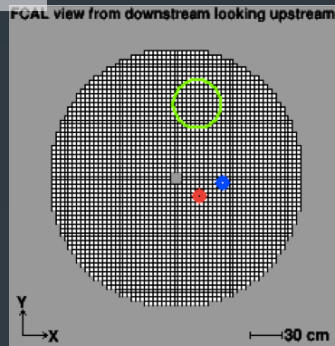
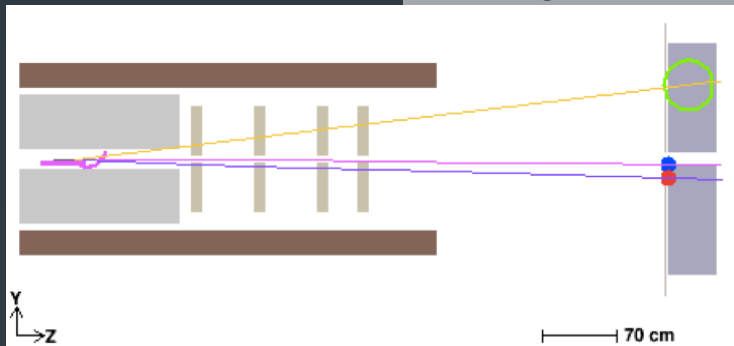
- Physical motivation (e.g. $a_\mu = (g_\mu - 2)/2$, TFF radius)
- Signature and selection: exclusive $\gamma p \rightarrow p\eta^{(\prime)} (-\rightarrow e^+e^-\gamma)$
- Show Monte Carlo studies for η and η' and benchmark results from other experiments based on https://halldweb.jlab.org/wiki-private/images/3/31/EtaMeeting_June5_pdf.pdf

- Validation with real data using events in π^0 mass window
 - Compare resolution $e^+e^-\gamma$
 - Compare efficiencies from π^0
 - Hoping to also include detailed studies of $p\eta\pi^+\pi^-$ (larger xsection and better acceptance)

Last presentation:

https://halldweb.jlab.org/wiki-private/images/9/96/EtaMeeting_Aug1.pdf

signature



main bkg

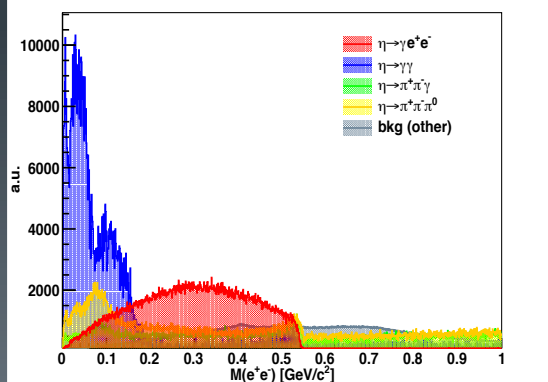
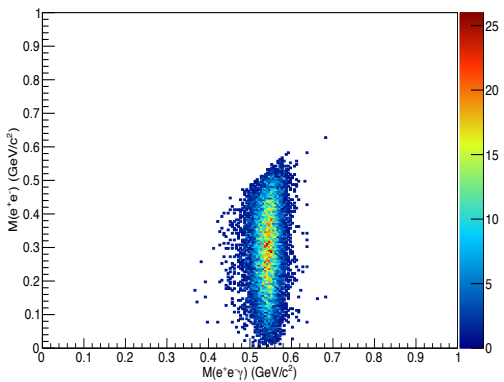
- $\eta \rightarrow e^+e^-\gamma$
- $\eta \rightarrow \pi^+\pi^-\gamma$
- $\eta \rightarrow \pi^+\pi^-\pi^0$
- $\eta \rightarrow \gamma\gamma \rightarrow e^+e^-\gamma$

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MC projections for "Phase IV"

$N_{SIG} \sim 1.1 \cdot 10^{10} \cdot 0.5 \cdot 10^{-3} \cdot 7 \cdot 10^{-3} \cdot 0.8 \cdot 10^{-1} \sim 30000$ events
 $N_{\eta \rightarrow \gamma\gamma} \sim 1.1 \cdot 10^{10} \cdot 0.5 \cdot 10^{-3} \cdot 0.39 \cdot 9 \cdot 10^{-5} < 1900$ events
 $N_{\eta \rightarrow \pi^+\pi^-\gamma} \sim 1.1 \cdot 10^{10} \cdot 0.5 \cdot 10^{-3} \cdot 0.046 \cdot 2 \cdot 10^{-5} < 50$ events (U.L.)
 $N_{\eta \rightarrow \pi^+\pi^-\pi^0} \sim 1.1 \cdot 10^{10} \cdot 0.5 \cdot 10^{-3} \cdot 0.23 \cdot 2 \cdot 10^{-5} < 250$ events (U.L.)

MC studies



DATA: first results

