

Nuclear photoproduction with GlueX

Topical Workshop, Jefferson Lab, 28–29 Apr 2016 [\[webpage\]](#)

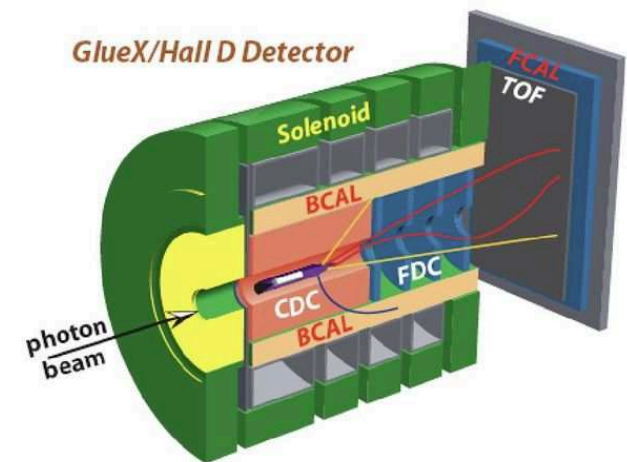
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Explore photoproduction on nuclear targets at energies $\nu \sim 5\text{--}12$ GeV as future option for GlueX in JLab Hall D after meson spectroscopy program

JLab Hall D schedule

Spectrum of light quark mesons and gluonic excitations	120 days
Meson and baryon decays to strange final states	200 days/ 220 days
Primakoff η radiative decay width	79 days
Charged pion polarizability $\gamma\gamma \rightarrow \pi\pi$	25 days
Rare η decays (Eta factory)	(130 days)
Secondary K_L beams Nuclear photoproduction ←	

→ Chudakov



Physics topics

- Medium modification of hadron properties
Metag, Wood, Weil, Sokhoyan, Gevorkyan
- Color transparency and short-range nuclear structure
Hafidi, Strikman, Piasetzky, Hen, Ilieva, Boeglin
- Polarization effects in meson photoproduction
Crede, Pasyuk
- Primakoff production and meson structure
Gasparyan, Larin
- J/ψ and open charm production
Brodsky, Weiss, Nadel-Turonski, Paolone

GlueX unique capabilities → Somov

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- Wide energy coverage from ~ 5 to ~ 12 GeV; highest energy available at CEBAF
- Excellent energy resolution through tagging
- Linear photon polarization
- Large-acceptance detector

Context: JLab12 nuclear physics program

- Medium modifications: CLAS12 hadron formation, Hall A+C EMC effect
- Color transparency: CLAS12, Hall C
- Short-range correlations: Hall A+C $x > 1$
- Deuteron electrodisintegration: Hall C
- Wide-angle exclusive processes: Hall C real Compton (pol), π^0 photoproduction; CLAS12 π^0/η electroproduction, ϕ electroproduction
- J/ψ near-threshold: CLAS12 e^+e^- , SoLID electroproduction, Hall A/C (?)

Complementarity, synergies?

Other photo/electro/hadroproduction facilities?