

Experiment and Physics Overview

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ERR: E12-19-003

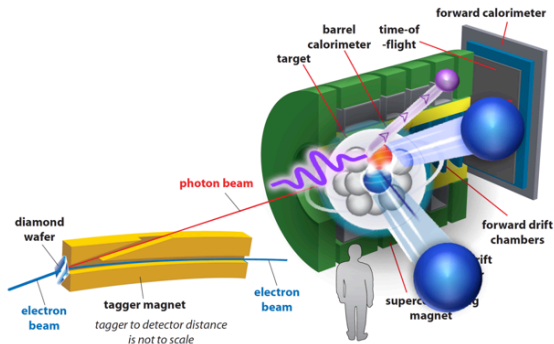
Date to be determined



E12-19-003: Studying Short-Range Correlations with Real Photon Beams at GlueX

Spokespersons

- Or Hen (MIT)
- Eli Piajetsky (Tel Aviv)
- Maria Patsyuk (JINR)
- Axel Schmidt (GW)
- Alexander Somov (JLab)
- Lawrence Weinstein (ODU)



This experiment tests foundational assumptions about short-range correlations.

And lots of other physics too!

Short-range correlated (SRC) nucleons are found in all nuclei.

e^- scattering at Jefferson Lab has led to high-impact discoveries.

Big list of papers

- Paper

Figs from three Nature papers

Neutron-proton pairing dominates, even in asymmetric nuclei.

We can understand short-distance structure using scale separation.

We have uncovered a connection between the EMC Effect and SRC nucleons.

E12-17-006A: A new high-statistics campaign to study SRCs with CLAS-12

The e^- program is built on a set of common assumptions.

- Scale separation
- Relativistic effects
- Reaction mechanisms
- Final state interactions

These assumptions can be put to the test with real photon beams.

There's lots of other photon-nucleus physics too!

The plan for this experiment:

- Nuclear targets
- GlueX detector in standard configuration
- Measure many photo-production channels on SRC nucleons
- Extract cross-section ratios
 - C/d
 - Channel 1 / Channel 2
 - Double ratios

Back-up