

# Welcome to the Workshop on Polarized Target Studies with Real Photons in Hall D

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GlueX Acknowledgements: [gluex.org/thanks](https://gluex.org/thanks)

# Goals for the workshop

Discuss ideas for a polarized target in Hall D. We tried to build in a good amount of discussion time while still keeping the workshop to a single session.

Produce a white paper which summarizes what was presented and discussed at the workshop.

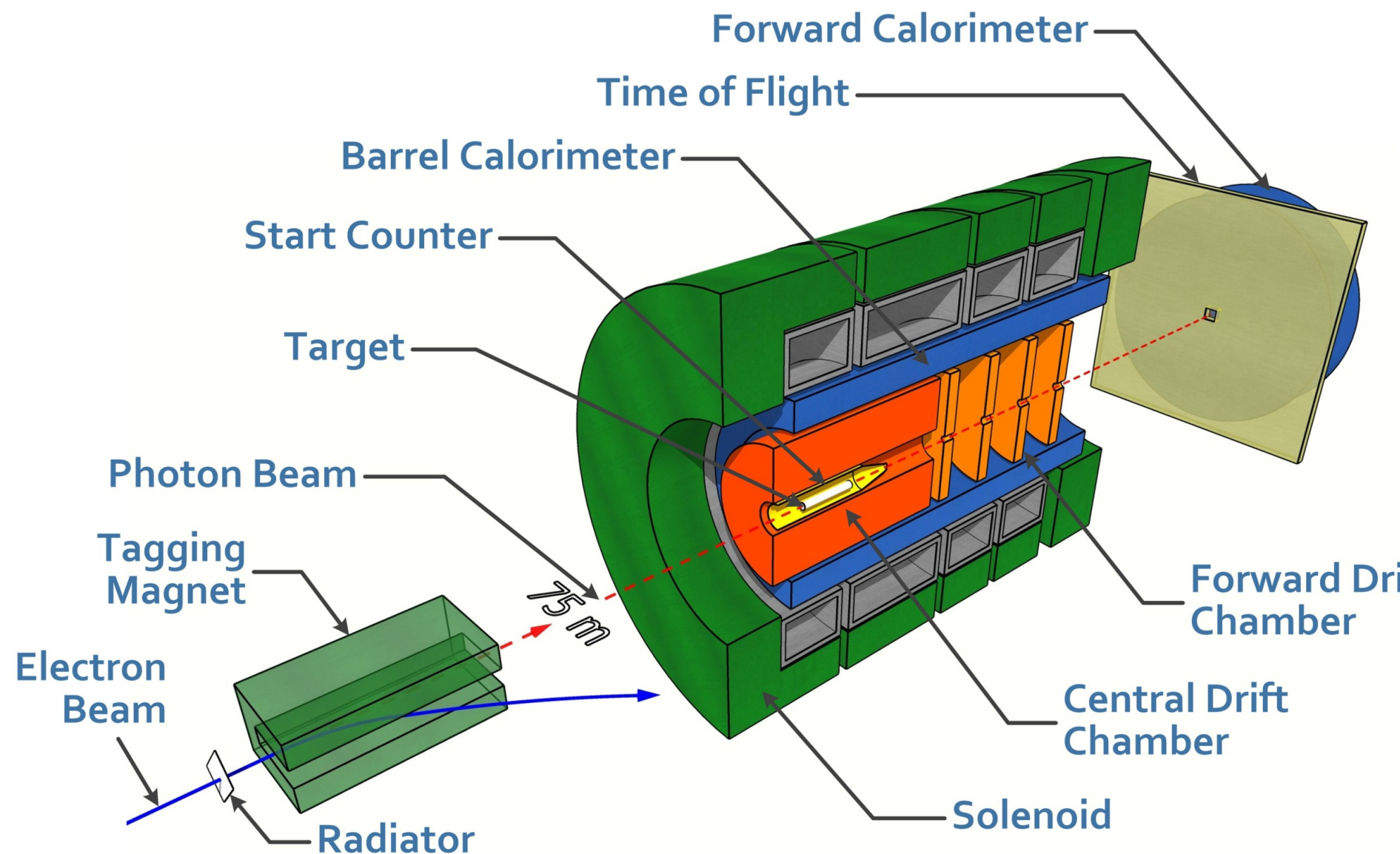
Other goals the people want to suggest?

# Administration

- Tallahassee participants:
  - Please use the microphone for questions
- Remote participants:
  - advise us of any A/V problems
  - “raise hand” or post in chat if you have questions
- Please remember that it is everyone's responsibility to:
  - conduct themselves in a professional manner free from discrimination, harassment, or retaliation
  - treat each other with respect and consideration
  - create a supportive and inclusive environment.

# Hall D at Jefferson Lab

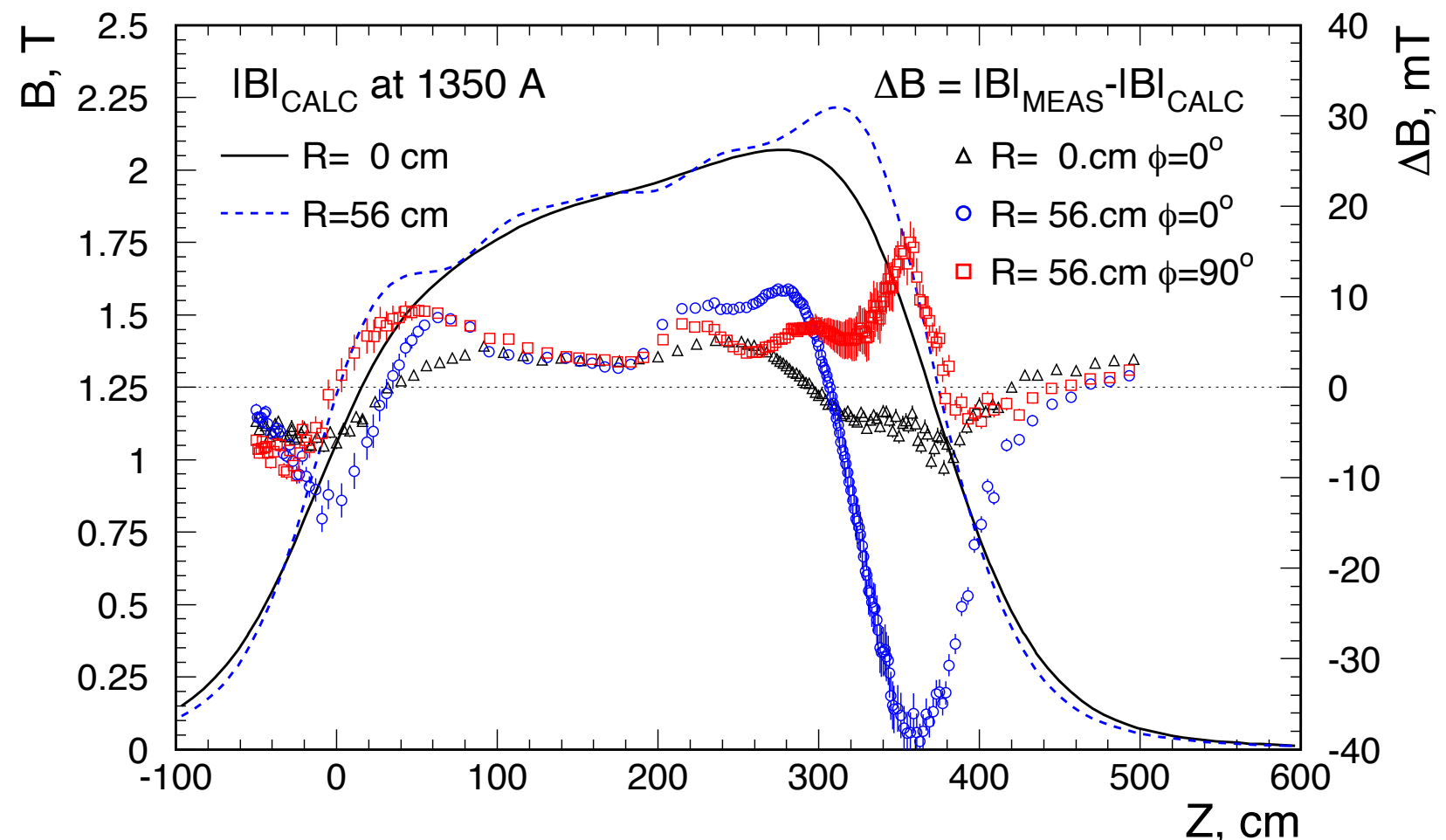
- Linearly and circularly polarized photon beam
- Variety of possible targets, including a new polarized target.
- Hermetic detector — large acceptance and high efficiency for charged and neutral particles



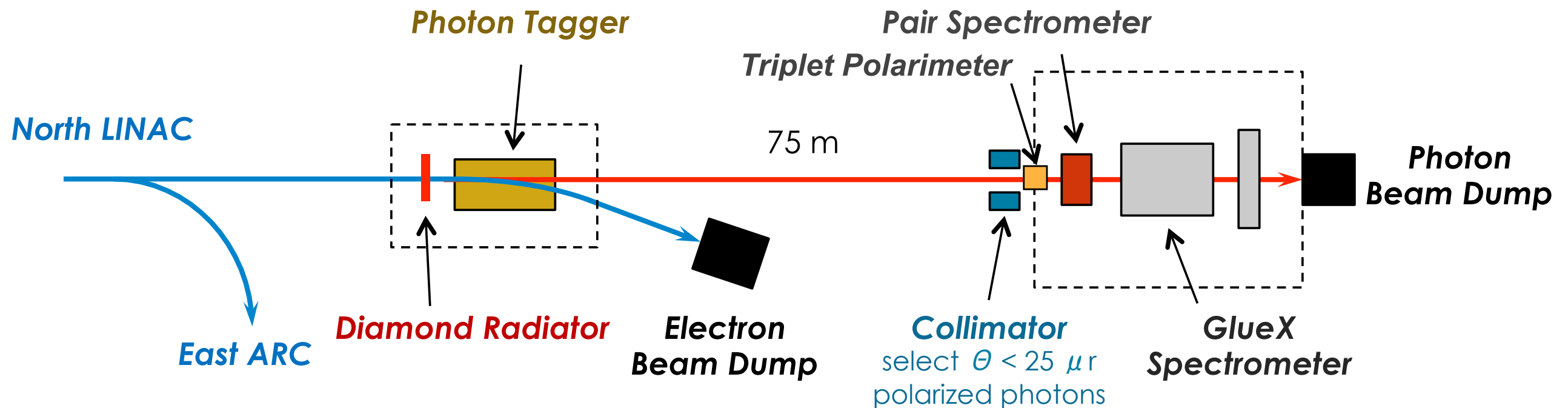
[Nucl. Instrum. & Meth. A987, 164807 \(2021\)](#)

# Brief Introduction to Hall D

- Current target position is at a magnetic field of  $\sim 1.6$  T in the Z direction.
- The solenoid field gives low resolution for charged particles traveling at high momentum in the forward direction. Resolution can be regained by detecting a fully exclusive reaction and doing a kinematic fit.



# Photon Beam



~12 GeV electrons from CEBAF

Tagged photon energies from ~3 GeV to end point

Tagging efficiency

~50% from 3 GeV to 8 GeV,

~95% from 8 GeV to end point

# Beam Polarization

- Produced by aligning a diamond with the electron beam, peak can be moved to different energies.
- Linearly polarized in coherent peak  $\sim 35\%$  at  $\sim 75\%$  of end point energy.
- Produced naturally during bremsstrahlung from longitudinally polarized electrons.
- Circularly polarized up to 100% of electron beam at end point.
- Electron beam polarization  $\sim 85\%$ , may be rotated away from longitudinal.

