

Abstract Submitted
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Collimation and tagging instrumentation for the GlueX Photon Beamline¹ RICHARD JONES, University of Connecticut — A new high energy polarized photon source is being constructed for the GlueX experiment at Jefferson Lab. Linear polarization is obtained using coherent bremsstrahlung from an oriented diamond radiator. By collimating the photon beam to a fraction of the characteristic bremsstrahlung angle m_e/E_0 , linear polarization of 40% is obtained at a photon energy of 9 GeV, for an incident electron beam of 12 GeV. Active stabilization of the photon beam spot on the collimator face is required in order to establish and maintain the alignment of the beam on the collimator axis with the required degree of accuracy. A photon beam centroid monitor has been developed for this purpose, based on the design of an electron beam halo detector that was invented for use at SLAC 30 years ago. Beam tests of this device in Hall B at 6 GeV show that it has the required bandwidth and sensitivity to be used in an active feedback loop in the electron beam steering controls. Such a feedback circuit is capable of locking the Hall D photon beam on the Hall D collimator with the required accuracy for GlueX at frequencies up to 1 kHz, over a wide range in beam current.

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