

# Beam Quality Requirements for the GlueX Barrel Calorimeter Test in Hall-B DRAFT\*\*\*DRAFT\*\*\*DRAFT

The Hall D BCAL (Barrel Calorimeter) test in the Hall B alcove is scheduled to take data between 22-Sep-2006 and 1-Oct-2006. The BCAL detector module will be located in the Hall B downstream alcove or on a platform just in front of the alcove. The test will not use the CLAS detector itself but will use the Hall B tagging system. The CLAS TPE target will be installed but will be empty. The BCAL detector is composed of a lead/scintillating fiber matrix roughly 15 cm x 15 cm x 4 m. The test will use a low energy, low intensity bremsstrahlung beam produced by a standard  $10^{-4}$  radiator collimated down to 2.6 mm by the standard collimation system. The photon beam will traverse the hall and impinge on the BCAL module itself. The electron beam energy will be 0.687 GeV with a maximum current of 5 nA. The photon beam will be tagged for energies between 0.135 and 0.653 GeV.

The beam requirements are standard for Hall B. The main concern is maintaining a stable photon beam in the downstream alcove. At these low beam energies the natural size of the beam is very large, so the 2.6 mm collimator will pick out approximately 7% of the total flux. Therefore the position of the electron beam must be stable and centered on the collimator aperture. Here is a list of beam quality requirements for the run are nominal for Hall B operation:

- **Beam position stability on the entrance to the Hall-B photon tagger dipole (controlled by the X and Y positions on 2C22A and 2C24A)  $< 100\mu m$ . (For the stability check the beam spot position on the tagger viewer can be used).**
- **Beam divergence at 2C24A  $< 100\mu rad$ ;**
- **Beam spot size at the tagger harp has  $\sigma_X \leq 200\mu m$  and  $\sigma_Y \leq 200\mu m$ ;**
- **Ratio peak/baseline in the tagger harp scan exceeding  $10^4$  for both X and Y;**
- **Stability of the beam intensity  $< 5\%$ ;**
- **The entire run has a fixed current of the Hall-B tagger dipole magnet.**

*Under NO any circumstances the position of the beam spot on the tagger viewer should be adjusted by changing the tagger magnet current!*