

Request for Parasitic Beam Test

in the Hall B Tagged Photon Beam during Spring 2011 running

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Equipment to be tested

1. prototype fine-grained tagging counter hodoscope (microscope) for Hall D;
2. photon beam profile and position monitor (active collimator) for Hall D.

Goals of the tests

1. verify simulated performance parameters of the microscope, including light yield, gain stability, energy sharing between adjacent channels, detection efficiency, and time resolution
2. test the position resolution of the active collimator, and measure its noise as a function of the bandwidth using a digital filter applied to a sampled waveform.

Desired beam conditions

1. bremsstrahlung photon beam of energy > 3 GeV endpoint;
2. tagged photon rate > 1 MHz over the full range of the Hall B tagger.

Hall resources and space

1. 1 square meter floor space under the Hall B tagger within 1-2 m of the end of the vacuum box;
2. rack space near the Hall B tagger to hold one stand-alone VME crate for data acquisition, a NIM crate for trigger logic, and a small table or support stand for holding a dedicated PC to be used for our stand-alone data acquisition system;
3. power near the Hall B tagger to run the PC and crates, an Ethernet connection for the data acquisition PC, and access to the accelerator RF signal;
4. space on top of the total absorption counter in its parked position at the back of the Hall B alcove, where we will mount our translation table to be able to horizontally scan the active collimator through the photon beam during tests;
5. space on the floor near the front of the alcove to set the PC that interfaces to the active collimator, power for the PC and preamplifier power supply, and an outside Ethernet connection for the PC.

Potential impacts on the running experiment

1. Permission will be requested from the CLAS shift leader before the active collimator is scanned through the photon beam at the back of the alcove. These will be timed to have minimum chance of interference with the primary program.
2. If a data acquisition computer crashes or hangs, or the translation table stops at its fail-safe limit switch, we will wait for access to the Hall in order to reboot the computer or reset the table. Normally this would only be possible during times when the primary experiment is not ready for beam, or the accelerator is down.

Installation

1. three shifts during the present installation period to install the microscope under the tagger, align its position relative to the beam path, and verify that the trigger and data acquisition are functioning correctly;
2. two shifts during the present installation period to install the active collimator on its translation stage in the back of the alcove, and configure the interfacing PC, verifying that the data acquisition and motor controls are functioning properly.

Removal

1. both the prototype microscope and the active collimator can be removed from the Hall within a single shift, to take place at the end of the run period;
2. GlueX personnel will be responsible for the removal of all dedicated equipment that was put in place for these tests.

Attachments

1. I. Senderovich and R.T. Jones, "Plan for Tagger Microscope Prototype Beam Test", submitted to Jefferson Lab Hall B leader V. Burkert October 18, 2010.