MEMORANDUM

FROM: Ashot Gasparian
Hampton University

TO: Larry Cardman
Associate Director
Physics Division
Jefferson Lab

CC: Bernhard Mecking
Hall B Leader

Date: March 1, 2001

Dear Dr. Cardman,

The PrimEx Collaboration would like to request beam time in Hall B during the second half of the year 2001 consisting of two periods of run-time, each of three (3) days duration. We are planning to perform beam tests for two key components of the experimental setup for the neutral pion lifetime measurement (E99-014).

1. Photon flux control with the new pair spectrometer (3 days, 9 eight-hour shifts). The goal for this run will be to commission the pair spectrometer (PS) (including its full complement of eight telescopes per detector arm) and the new total absorption counter (TAC) in order to test the ability of the systems to monitor photon flux at the sub 1% level. The PS is intended to make the connection between calibration normalization runs with the TAC at low rates and the data taking runs at high rates. The tasks to be accomplished are the following:

a) plateau the counters
b) debug electronics and set timings;
c) commission the new TAC and measure the absolute tagging efficiencies and their stability vs. intensity;

d) perform rate tests in PS vs. beam intensity: this will be done for three different PS target thicknesses ($5x10^{-4}$, $5x10^{-3}$ and $5x10^{-2}$ r.l.).

e) the rates in the PS vs. the beam position on the production target will be used to verify the target thicknesses which have been previously measured by X-ray absorption studies.

2. Test of the hybrid calorimeter (HYCAL) prototype detector (3 days, 9 eight-hour shifts). The goal for this run will be to test the trigger rates vs. beam intensity and the "beam hole" size in the calorimeter. Also, the veto counters and the fast electronics will be tested during this run. The tasks to be accomplished are the following:

a) rates in individual modules vs. beam intensity, beam position and the production target thickness (1%, 3% and 5% r.l.)
b) rates in fast electronics for different trigger logic;
c) radiation hardness tests of the UVA fast electronics modules;
d) rates in the veto counters;
e) tests of gain shifts vs. beam intensity in the PbWO crystals;
f) collect calibration data for the energy and position resolution studies, particularly for the transition region between the crystals and lead glass modules.

Beam Requirements:

We are requesting two separate three-day run periods of beam time (9 eight-hour shifts) in Hall B: Electron beam intensity from 50 pA to 100 nA; Electron beam energy: 5.65 GeV (maximum available beam energy for that run period). We will use Hall B photon tagger with
$Eg = (0.85 - 0.95) \times E_e = 4.8 - 5.36$ GeV.

Manpower:

Manpower will be provided by the PrimEx Collaboration with the help of Hall B staff members (beam line, tagger and DAQ groups).

With sincere regards,

Ashot Gasparian

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