MEMORANDUM

FROM: Ashot Gasparian
Contact person for the PrimEx Collaboration

TO: Larry Cardman
Associate Director
Physics Division
Jefferson Lab

CC: Bernhard Mecking
Hall B Leader

Date: November 26, 2001

Dear Dr. Cardman,

In order to test and develop the experimental setup for the neutral pion lifetime measurement (E99-014), the PrimEx Collaboration would like to request beam time in Hall B during the year 2002. We are requesting for two periods of run-time, each of three (3) days duration. During the first period, we will check the performance of the hybrid calorimeter (HYCAL) prototype detector in the high intensity photon beam. These tests will define several key design parameters of the HYCAL electromagnetic calorimeter which is planned to be assembled and tested by the end of the year 2002.

During the photon runs last summer in Hall B, the PrimEx pair spectrometer (PS) was commissioned in parallel with the g8 and g6 experiments. We also had 2 days of dedicated beam time during September when we commissioned the new total absorption counter (TAC) to test the ability of the PS-TAC system to monitor photon flux at the sub 1% level. High quality data were also taken for the PbWO crystal detectors during this run. Currently, we are in the process of analyzing the data. Part of the preliminary results have already been reported during the recent CLAS collaboration meeting. The final results for both the flux control system and the PbWO crystal detector resolutions will be presented at upcoming conferences and submitted for publications soon.

1. First period of beam time request: May-June, 2002, 3 days, 9 eight-hour shifts. The prototype detector for the HYCAL electromagnetic calorimeter will be tested. The major 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 rates will be tested. The tasks to be accomplished are the following:

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

2. Second period of beam time request November-December, 2002, 9 eight-hour shifts. Tests of the HYCAL calorimeter. The goal for this run will be to commission the HYCAL detector, check the trigger rates vs. beam intensity and production target thickness. The tasks to be accomplished are similar to the prototype detector tests, as in part 1. During this run, the whole PrimEx setup will be checked and calibrated for running of the experiment which is planned by the collaboration for the first part of the year 2003.

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: 5.7 GeV (maximum available beam energy for that run period). We will use the Hall B photon tagger with Eg = (0.85 - 0.95) x Ee =4.8 - 5.4 GeV.

Manpower:

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

With sincere regards,

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