**For PAC48 Submission**

 June 1st, 2020

[https://misportal.jlab.org/pacProposals/proposals/new] FireFox is favorite

New Proposal

Proposal Cover Sheet (PAC 48)

Proposal Type: New Proposal

Basic Information

Physics Category: The Hadron Spectra as probes of QCD

Title: Strange Hadron Spectroscopy with Secondary KL Beam in Hall D

Days Requested for Approval: 200

Experiment Halls: D

Approved, Conditionally Approved, and/or Deferred Experiment(s) or proposals:

Deferred Experiment: PR12–17–001

Deferred Experiment: PR12–18–002

Recommendation: C219001

Collaboration-Approved Proposals: If you will be running in parallel with an approved experiment, please indicate the experiment number:

Our experiment cannot run in parallel with accepted experiments by PAC

Author List: <uploaded>

Contact Us

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Major Installations

Equipment:

+ GlueX

+ New Compact Photon Source will be located downstream of the tagger magnet

+ New Be-target Assembly will be located at the beginning of the collimator cave

+ New Flux Monitor will be located downstream the Pair Spectrometer magnet and upstream

Pair Spectrometer shielding wall

+ Replace a cryogenic target cell

Support Structures:

+ Add two concrete walls inside the collimator cave

+ Add new vacuum beam pipe between Be and cryogenic targets

- Remove two collimators from the collimator cave

- Remove detectors of the Pair Spectrometer

+ Add support structure for the Be target assembly

+ Add support structure for the Flux Monitor

+ Add support structure for the Compact Photon Source

+ Add the pulse picking system and the laser amplifier for a beamline delivery system

Data Acquisition/Reduction:

Support Structures: GlueX

Software: GlueX

Major Equipment:

Magnets: GlueX & CPS & Flux Monitor

Power Supplies: GlueX & CPS & Flux Monitor

Detectors: GlueX & Flux Monitor

Electronics: GlueX & Flux Monitor

Computer Hardware: GlueX

Other Resources:

+ Add cooling system for the Compact Photon Source

+ Add cooling system for the Flux Monitor

+ Add cooling system for the Be-target Assembly

+ Add motion system for the Be-Target

Beam Requirement List:

Beam Energy (MeV) Mean Beam Current (μA) Polarization and Other Requirements

12000 5 64 ns repetition

Est Beam-On Time (hours) Target Materials & Thickness (mg/cm^2)

4800 Liquid Deuterium & 6496

Liquid Hydrogen & 2834

Beryllium & 73735

Tungsten photon beam absorber & 193000

Copper radiator (10% r.l.) & 1281

Hazard Identification Checklist:

Cryogenics:

Beamline Magnets N/A

Analysis Magnets Liquid nitrogen, liquid helium

Target Magnets N/A

Type: Liquid hydrogen, liquid deuterium

Flow Rate: N/A

Capacity: N/A

Electrical Equipment:

Cryo/Electrical Devices:

Capacitor Banks:

High Voltage: Yes

Exposed Equipment:

Radioactive materials: N/A

Pressure Valves:

Inside Diameter: N/A

Operating Pressure: Existing pressure relief valves on the cryogenic target system

Window Material: N/A

Window Thickness: N/A

Special Target Materials: Deuterium

Flammable:

Type: Hydrogen & deuterium

Flow Rate: N/A

Capacity: N/A

Drift Container:

Type: N/A

Flow Rate:

Capacity:

Other Target Materials:

Beryllium

Liquid Hydrogen

Tungsten

Copper

Vacuum Vessels:

Inside Diameter

Operating Pressure: Existing target vacuum vessels

Window Material:

Window Thickness:

Radioactive Sources:

Permanent Installment

Temporary Use

Type: N/A

Strength

Larger Mechanical structure:

Lifting Devices

Motion Controllers

Scaffolding

Elevated Platforms

Lasers:

Type: N/A

Wattage

Class

Hazardous Materials: N/A

General:

Base Equipment: Yes

Temp. Mod. To Base Equip.: "Coll. cave" - all the equipment but the perm. magnet must be removed (not the collimators only)

Perm. Mod. to Base Equip.: the CPS would stay there permanently (too hot to take apart)

Major New Apparatus: Yes

Other General: Temp. Mod. To Base Equip.: Increase the cryogenic target cell volume

Temp. Mod. To Base Equip.: low bunch repetition

Computing Requirement List:

Silo/Mass Storage (Tape): 700 TB

Amount of Simulated Data Expected: 140 TB

Amount of Raw Data Expected (TB): 230 TB

Amount of Processed Data Expected (TB): 360 TB

Online Storage Disk Required (TB): 50 TB

Imported Data Expected from Offsite Institution: 10 TB

Exported Data Expected to Offsite Locations: 500 TB

Computing:

Simulation Requirements (SPEC CINT 2000hrs): 5.3Mcore-hrs (2016 farm node)

Production (Replay, Analysis, Cooking) Requirements (SPEC CINT 2000hrs):

23M core-hrs (2016 farm node)

Other Requirements:

Please add any additional information that will be useful for JLab's IT Division regarding unique

configurations or that may require additional resources and/or coordination. Please indicate if possible what fraction of these resources will be provided by collaborating institutions and how much is expected to be provided by JLab. N/A

Assumed Resource Requirements

Use this section to provide any information regarding the assumed requirements for the resources needed.

Assume standard GlueX computing workflow. Details of numbers in the requirement list calculated via GlueX computing model. See details here:

<https://github.com/JeffersonLab/hd_utilities/blob/master/comp_mod/KLong_proposal2019.xml>

There are several supplemental files:

1) Cover Letter

2) New Equipment