



# Jefferson Lab PAC26 Proposal Cover Sheet

This document must  
be received by close  
of business Monday,

May 24, 2004 at:

Jefferson Lab  
User/International Liaison  
Mail Stop 12B  
12000 Jefferson Ave.  
Newport News, VA  
23606

Experimental Hall: C

Days Requested for Approval: 23

☐ **Proposal Title:**

Measurement of GEp/GMp using elastic polarized p(polarized e e'p) up to  $Q^2=5.6(\text{GeV}/c)^2$

## Proposal Physics Goals

Indicate any experiments that have physics goals similar to those in your proposal.

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

PR-01-105, E-01-001, PR-04-014

## Contact Person

**Name:** Xiaochao Zheng

**Institution:** Jefferson Lab/Argonne National Laboratory

**Address:** 16/98, MS 16B

**Address:** JLab

**City, State, ZIP/Country:**

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## Jefferson Lab Use Only

Receipt Date: \_\_\_\_\_

By: \_\_\_\_\_

# LAB RESOURCES LIST

JLab Proposal No.: \_\_\_\_\_  
(For JLab ULO use only.)

Date 5/24/2004

List below significant resources — both equipment and human — that you are requesting from Jefferson Lab in support of mounting and executing the proposed experiment. Do not include items that will be routinely supplied to all running experiments such as the base equipment for the hall and technical support for routine operation, installation, and maintenance.

## **Major Installations** (*either your equip. or new equip. requested from JLab*)

Polarized target  
Big Electron Telescope Array (BETA)  
Scintillation counter 3-layer wall

## *New Support Structures:*

BigCal vertically adjustable stand  
BETA Cherenkov+Lucite Hodoscope stand  
Scintillator counter stand

## **Data Acquisition/Reduction**

### *Computing Resources:*

### *New Software:*

## **Major Equipment**

Magnets:

Power Supplies:

Targets: U. of Virginia polarized target

Detectors: BETA  
U. of Virginia scintillation counter

Electronics:

Computer Hardware:

Other:

## **Other:**

- Target Beam Position Monitor (SEM) used in E93-026 and E-01-006
- Hall C's BE and BZ1 chicane magnets for upstream beam line
- He bag with matching beam snout for downstream beam line

# BEAM REQUIREMENTS LIST

JLab Proposal No.: \_\_\_\_\_ : 5/24/2004 Date

Hall: c Anticipated Run Date: 2006 PAC Approved Days: 23

Spokesperson: Xiaochao Zheng

Hall Liaison: Mark Jones

Phone: 757-269-5013

E-mail: xiaochao@jlab.org

List all combinations of anticipated targets and beam conditions required to execute  
(This list will form the primary basis for the Radiation Safety Assessment Document (RSAD) must be performed for each experiment.)

Condition No.	Beam Energy (MeV)	Mean Beam Current (μA)	Polarization and Other Special Requirements (e.g., time structure)	Target Material (use multiple rows for complex targets — e.g., w/windows)	Material Thickness (mg/cm <sup>2</sup> )	Est. Beam-On Time for Cond. No. (hours)
1	5552	0.085-0.1	80% longitudinal	H	275	120
				15N	1375	
				He	320	
				Al	202	
				Cu	132	
2	5552	0.085-0.1	80%	Same as 1		254
3	5552	0.06-0.12	80%	Same as 1		32
4	5552	0.2		C	1553	12
5	5552	0.1-0.2		C (commissioning)	1553	32
6	5552	0.2		He	580	6
7	5552	0.1	80%	Fe (Moller)	3	13

The beam energies,  $E$  available are  $= E_N \times E$  where  $N = 1, 2, 3, 4, \dots, 50$ , i.e., available  $E$  are 800, 1600, 2400, 3200, and 4000 MeV. Other energies should be arranged with the Hall Leader before listing.

# HAZARD IDENTIFICATION CHECKLIST

JLab Proposal No.: \_\_\_\_\_

Date : 5/24/2004 \_\_\_\_\_

(For JLab U/I Liaison Office use only.)

Check all items for which there is an anticipated need.

<b>Cryogenics</b> <input type="checkbox"/> beamline magnets <input type="checkbox"/> analysis magnets <input checked="" type="checkbox"/> target type: <u>Polarized</u> flow rate: <u>3 l/h LHe</u> capacity: <u>60 l</u>	<b>Electrical Equipment</b> <input type="checkbox"/> cryo/electrical devices <input type="checkbox"/> capacitor banks <input type="checkbox"/> high voltage <input type="checkbox"/> exposed equipment	<b>Radioactive/Hazardous Materials</b> List any radioactive or hazardous/toxic materials planned for use: Target: ammonia (15NH3) - two target cells, ~ 10 g each
<b>Pressure Vessels</b> _____ inside diameter _____ operating pressure _____ window material _____ window thickness	<b>Flammable Gas or Liquids</b> type: _____ flow rate: _____ capacity: _____  <b>Drift Chambers</b> type: _____ flow rate: _____ capacity: _____	<b>Other Target Materials</b> <input type="checkbox"/> Beryllium (Be) <input type="checkbox"/> Lithium (Li) <input type="checkbox"/> Mercury (Hg) <input type="checkbox"/> Lead (Pb) <input type="checkbox"/> Tungsten (W) <input type="checkbox"/> Uranium (U) <input type="checkbox"/> * Helium ( <sup>3</sup> He) <input type="checkbox"/> Other (list below)  * U/I Liaison Office to notify RADCON
<b>Vacuum Vessels</b> <u>106 cm</u> inside diameter <u>1E-6 torr</u> operating pressure <u>Al</u> window material <u>.008 inch</u> window thickness	<b>Radioactive Sources</b> <input type="checkbox"/> permanent installation <input type="checkbox"/> temporary use type: _____ strength: _____	<b>Large Mech. Structure/System</b> <input type="checkbox"/> lifting devices <input type="checkbox"/> motion controllers <input type="checkbox"/> scaffolding or <input checked="" type="checkbox"/> elevated platforms
<b>Lasers</b> type: <u>Nitrogen</u> wattage: <u>&lt; 10 W</u> class: <u>IV</u>  Installation: <input type="checkbox"/> permanent <input checked="" type="checkbox"/> temporary  Use: <input checked="" type="checkbox"/> calibration <input type="checkbox"/> alignment	<b>Hazardous Materials</b> <input type="checkbox"/> cyanide plating materials <input type="checkbox"/> scintillation oil (from) <input type="checkbox"/> PCBs <input type="checkbox"/> methane <input type="checkbox"/> TMAE <input type="checkbox"/> TEA <input type="checkbox"/> photographic developers <input checked="" type="checkbox"/> other (list below) Ammonia: ~ 20g in target 200 g in Hall storage	<b>General</b>  Experiment Class:  <input type="checkbox"/> Base Equipment <input type="checkbox"/> Temp. Mod. to Base Equip. <input type="checkbox"/> Permanent Mod. to Base Equipment <input checked="" type="checkbox"/> Major New Apparatus  Other:

# Computing Requirements List

**Proposal Title:** Measurement of GEp/GMp using elastic polarized p(polarized e e'p) up to  $Q^2=5.6(\text{GeV}/c)^2$

**Spokesperson:** Xiaochao Zheng **Experimental Hall:** C

## Raw Data Expected

**Total:** 2 TB **Per Year (long duration experiments only):**

**Simulation Compute Power (SPECint95 hours) Required:** None

**On-Line Disk Storage Required:** 200 GB

**Imported Data Amount from Outside Institutions:**

**Exported Data Amount to Outside Institutions:** 2 TB

**Expected Mechanism for Imported/Exported Data:** Magnetic tape / network data transfers

## Special Requirements

For example, special configuration of data acquisition systems) that may require resources and/or coordination with JLab's Computer Center. 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.

Submit