



Jefferson Lab PAC25 Proposal Cover Sheet



This document must be received by close of business Tuesday, December 2, 2003 at:

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

Experimental Hall: C

Days Requested for Approval: 17

Proposal Title:

Measurement of GEp/GMp using elastic polarized p(polarized e, e')p up to $Q^2 = 3.50 \text{ (GeV/c)}^2$

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

Contact Person

Name: Xiaochao Zheng

Institution: Argonne National Laboratory

Address: Physics Division-203

Address: 9700 South Cass Avenue

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Jefferson Lab Use Only

Receipt Date: _____

By: _____

LAB RESOURCES LIST

JLab Proposal No.: _____

(For JLab ULO use only.)

Date 12/02/2003

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

New Support Structures:

Data Acquisition/Reduction

Computing Resources:

New Software:

Major Equipment

Magnets:

Power Supplies:

Targets: U. of Virginia's polarized target

Detectors:

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.: _____ Date: 12/02/2003

Hall: c Anticipated Run Date: July 2006 PAC Approved Days: 17

Spokesperson: Xiaochao Zheng

Hall Liaison: Mark Jones

Phone: 630-252-3431

E-mail: xiaochao@jlab.org

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

Condition No.	Beam Energy (MeV)	Mean Beam Current (μ A)	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 ²)	Est. Beam-On Time for Cond. No. (hours)
1	3600	0.085 -0.1	80% longitudinal polarization	H	275	5
				15N	1375	
				He	320	
				Al	202	
				Cu	132	
2	6000	0.085-0.1	80%	Same as condition 1		46
3	6000	0.085-0.1	80%	Same as condition 1		246
4	3600	0.2		C	1553	2
5	6000	0.2		C	1553	12
6	3600	0.1	80%	Fe (Moller)	3	1
7	6000	0.1	80%	Fe	3	11
8	6000	0.2		He	580	4

The beam energies, E_{Beam} , available are: $E_{\text{Beam}} = N \times E_{\text{Linac}}$ where $N = 1, 2, 3, 4, \text{ or } 5$. $E_{\text{Linac}} = 800$ MeV, i.e., available E_{Beam} 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 : 12/02/2003

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

Check all items for which there is an anticipated need.

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

Computing Requirements List

Proposal Title: Measurement of GEp/GMp using elastic polarized p(polarized e, e')p up to $Q^2 = 3.50$ (GeV/c)²

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

Raw Data Expected

Total: 1 TB **Per Year (long duration experiments only):** _____

Simulation Compute Power (SPECint95 hours) Required: None

On-Line Disk Storage Required: 100 GB

Imported Data Amount from Outside Institutions: _____

Exported Data Amount to Outside Institutions: 1 TB

Expected Mechanism for Imported/Exported Data: Magnetic tape / network file 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