Jefferson Lab PAC 43
Proposal Cover Sheet

Proposal Title: Deeply virtual Compton scattering on the neutron with a longitudinally polarized deuteron target
Experiment Hall: B
Days Requested for Approval: 125 days in total. 62 new days, and 63 days shared with previously approved experiments

Proposal Physic Goals:
Indicate any Experiments that have physics goals similar to those in your proposal. Approved Conditionally approved, and/or Deferred Experiment(s) or proposals.

The experiment will perform a first-time measurement of target-spin asymmetries and double-spin asymmetries for neutron-DVCS using a polarized target. The ultimate goal is extracting for the first time neutron Compton Form Factors, which are linked to the Generalized Parton Distributions. This purpose is shared by the approved experiment E12-11-003, "Deeply virtual Compton scattering on the neutron with CLAS12 at 11 GeV". The CFFs extraction is possible through the combination of the two experiments.

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

We will run approximately 50% of the proposed experiment in parallel with approved experiments in CLAS12 Run Group RG-C (006-109, E12-007-107, and E12-09-007b). New beam time is required for the remaining 50%.

Key Experimental Parameters

List Beam Energies and Beam Days: (e.g. 30 Days at 11 GeV, 20 Days at 8 GeV)

125 days at 11 GeV

List Range of Beam Currents: (e.g. 10-60 mA)

10 nA

Indicate Major Apparatus: (e.g. CLAS12 & RICH, GLUEX, SHMS, HMS, SBS, SOLID)

No Data

Collaboration-Approved Proposals:

If you will be running in parallel with an approved experiment, please indicate the experiment number

We will run approximately 50% of the proposed experiment in parallel with approved experiments in CLAS12 Run Group RG-C (006-109, E12-007-107, and E12-09-007b). New beam time is required for the remaining 50%.

Contact Person:

Name:	Silvia Niccolai
Institution:	Institut de Physique Nucléaire d'Orsay
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Spokesperson:

1. Angela Biselli
2. Chris Keith
3. Daria Sokhan
4. Silvia Pisano

Receipt Date: No Data

Lab Resources List

JLab Proposal No. : No Data
Date: No Data

List below significant resources - both in equipment and human - that you are requesting from Jefferson Lab in support of mounting and executing the proposed experiment. Do not include item 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

No Data

New Support Structures:

No Data

Data Aquisition/ Reduction

New Support Structures:

Standard DAQ system of CLAS12

New Software:

Standard calibration and reconstruction software for CLAS12

Major Equipment:

Magnets:

No Data

Power Supplies:

No Data

Targets:

CLAS12 longitudinally polarized target (ND3)

Detectors:

CLAS12

Electronics:

No Data

Computer Hardware

No Data

Other:

No Data

Beam Requirements List

JLab Proposal No: No Data **Hall:** B **Date:** No Data

Anticipated Run Date: No Data **PAC Approved Days:** No Data

Contact Person: Silvia Niccolai **Phone:** +33 1 69 15 45 00

Email: silvia@jlab.org **Hall Liaison:** Volker Burkert

List all combinations of anticipated targets and beam considerations 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.)

Beam Energy(MeV)	Mean Beam Current(μA)	Polarization and Other Requirements	Est Beam-On Time(hours)	Target Materials	Target Thickness(mg/cm²)
11000	0.01	beam polarization > 0.8	2400	Deuterated ammonia (ND3)	2400 mg/cm2
11000	0.01	beam polarization > 0.8	2400	Carbon	2400 mg/cm2

The beam energies, EBeam, available are: EBeam = N x ELinac where N = 1, 2, 3, 4, or 5. ELinac = 800 MeV, i.e, available EBeam 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: No Data **Date:** No Data

Check all items for which there is an anticipated need.

Cryogenics
- ☐ Beamline Magnets
- ☑ Analysis Magnets
- ☐ Target Magnets

Type: CLAS12 solenoid, torus
Flow Rate: _____
Capacity: _____

Electrical Equipment
- ☑ Cryo/Electrical Devices
- ☐ Capacitor Banks
- ☑ High Voltage
- ☐ Exposed Equipment

Radioactive Materials
List radioactive or hazardous/toxic materials planned for use:
_____

Pressure Vessels
- ☐ Inside Diameter
- ☐ Operating Pressure
- ☐ Window Material
- ☐ Window Thickness

Flammable
Type: _____
Flow Rate: _____
Capacity: _____

Drift Container
Type: _____
Flow Rate: _____
Capacity: _____

Other Target Materials
- ☐ Beryllium
- ☐ Lithium
- ☐ Mercury
- ☐ Lead
- ☐ Tungsten
- ☐ Uranium
- ☐ Helium

Other Target Material:
ND3, Carbon

Special Target Materials
- ☐ Helium
- ☐ Deuterium

Vacuum Vessels
- ☐ Inside Diameter
- ☐ Operating Pressure
- ☐ Window Material
- ☑ Window Thickness

Radioactive Sources
- ☐ Permanent Installment
- ☐ Temporary Use

Type: _____
Strength: _____

Large Mech. Structures
- ☐ Lifting Devices
- ☐ Motion Controllers
- ☐ Scaffolding
- ☐ Elevated Platforms

Lasers
Type: _____
Wattage: _____
Class: _____
- ☐ Permanent
- ☐ Temporary
- ☐ Calibration
- ☐ Alignment

Hazardous Materials
- ☐ Cyanide Plating Materials
- ☐ Scintillation oil
- ☐ PCBs
- ☐ Methane
- ☐ TMAE
- ☐ TEA
- ☐ Photographic Developers

Other Hazardous Materials:
_____

General
- ☑ Base Equipment
- ☐ Temp. Mod. To Base Equip.
- ☐ Perm. Mod. to Base Equip.
- ☐ Major New Apparatus

Other General:
_____

Computing Requirements List

Proposal Title: Deeply virtual Compton scattering on the neutron with a longitudinally polarized deuteron target
Contact Person: Silvia Niccolai
Experiment Hall: B

Data

Silo/Mass Storage (Tape): 1000 TB

Amount of Simulated Data Expected (TB): 100 TB

Amount of Raw Data Expected (TB): 1000 TB

Amount of Processed Data Expected: 500 TB

Online Storage (Disk) Required (TB): 100 TB

Imported Data Expected from Offsite Institutions: No Data

Exported Data Expected to Offsite Locations: No Data

Computing

Simulation Requirements (SPEC CINT2000 hrs): 3G

Production (Replay, Analysis, Cooking) Requirements (SPEC CINT2000 hrs): 2.5G

Other Requirements:

Please add any additional information that will be useful for JLab's Information Technology group 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.

No Data