

**MEMORANDUM OF UNDERSTANDING
BETWEEN THE
LABORATOIRE DE PHYSIQUE CORPUSCULAIRE
IN2P3/UNIVERSITÉ BLAISE PASCAL, CLERMONT-FERRAND
AND THE
THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY
FOR AN
ELECTRON DETECTOR FOR THE HALL A COMPTON POLARIMETER**

I. INTRODUCTION

This Memorandum of Understanding (MOU) outlines the activities that members of the Laboratoire de Physique Corpusculaire Université Blaise Pascal, Clermont-Ferrand (LPC) are carrying out in collaboration with the Thomas Jefferson National Accelerator Facility (JLab). The goal of this collaboration is the design, construction and initial operation of an electron detector for the Compton Polarimeter to be utilized in Hall A at JLab for nuclear physics research. This document constitutes an understanding between the LPC and JLab on the resources needed to perform the work and a schedule for deliverables. It does not constitute a contractual obligation on the part of either institution.

II. PERSONNEL

- A. The LPC shall provide adequate personnel for the successful completion of the project. Leading executor of the work is B. Michel. The other members of the personnel of the LPC may be changed as appropriate to provide the necessary mix of scientific and technical talent.
- B. The spokesperson for the LPC participants is B. Michel.
- C. S. Nanda, a member of the JLab Physics Division, will act as liaison physicist with the LPC.

III. COORDINATION AND RESPONSIBILITIES

The LPC group will participate in all aspects of the design, construction, testing, installation, and commissioning of the electron detector. They will also participate fully in whatever related functions are necessary to integrate the electron detector into the Hall A Compton Polarimeter.

IV. EQUIPMENT AND SERVICES PROVIDED

The electron detector consists of four planes of silicon micro-strip detectors mounted in a vacuum chamber connected to the Hall A beam line between the third and fourth dipole magnets of the Compton Polarimeter chicane. It will have the capability to be remotely moved in a vertical plane in and out of the electron beam pipe. Each micro-strip plane has 192 channels of silicon micro-strips with a pitch of between 250 and 325 μm . The planes are stacked with 1 cm spacing. The detailed technical specifications for the detector will be determined jointly by JLab and LPC.

A. LPC

1. The LPC group shall provide the complete design for the integration of the electron detector sub-system into the Compton Polarimeter.
2. The LPC shall provide the front-end and read-out electronics for the electron detector
3. The LPC group shall provide the vacuum chamber and associated vacuum and mechanical components for the electron detector.
4. The LPC shall provide the vertical motion system with remote control and remote reset features.
5. The LPC shall provide the beam fast shut-down interlock system for the motion control.
6. The LPC shall provide the design drawings and operating manuals in English to JLab

B. JLab

1. JLab will provide funding for the procurement of the silicon micro-strips.
2. JLab will provide necessary data acquisition software for the electron detector

V. FUNDING PLAN

A. Equipment

1. JLab will provide the necessary funds for the procurement of the silicon micro-strips.
2. LPC will provide the necessary funds for the procurement of the rest of the electron detector sub-systems

B. Labor

JLab shall provide support for LPC personnel while working at JLab. The support provided by JLab will consist of per diem support and lodging in the Jefferson Lab guest house while at JLab. JLab and LPC shall mutually agree on the number of LPC group personnel on-site at any particular time according to the work required. The total number of LPC group personnel averaged over a full calendar year will not exceed 1 FTE/year.

VI. MILESTONE SCHEDULE

Task	Completion Date

Technical specifications completed	April 2006
Design of the detector subsystem	June 2006
Procurement of micro-strips	April 2007
Fabrication of electronics components	March 2007
Fabrication of mechanical components	May 2007
Full subsystem test at LPC	August 2007
Installation in Hall A at JLab	December 2007

VII. SPECIAL CONSIDERATIONS

- A. JLab will have the final responsibility for acceptance of all deliverables and retains the right to terminate or renegotiate this MOU if the requirements of specification, schedule, and costs cannot be met by the LPC.
- B. All items bought or fabricated using JLab funds will remain property of JLab. Any apparatus installed by the LPC as part of the experimental equipment will have a LPC property tag, but will remain a part of the experimental equipment until it is decommissioned or replaced.
- C. JLab management will make all reasonable effort to see that collaboration participation will be rewarded in terms of priority use of the Compton polarimeter.
- D. The continuity of this agreement is dependent on the approval of funds for both parties for each fiscal year of the project.
- E. The parties agree to mutually assist each other and to take all appropriate actions in ensuring expeditious resolution of customs and border requirements.
- F. The present MOU is concluded for five (5) years and may be extended by mutual agreement between JLab and LPC.
- G. This agreement may be amended as necessary.

VIII. SIGNATURES

Christoph W. Leemann
JLab Director

Michel Spiro
IN2P3 Director

Lawrence S. Cardman
JLab Associate Director
for Physics

Alain Baldit
LPC Director

Cornelis W. de Jager
JLab Hall A leader

Bernard Michel
LPC Spokesperson

Sirish K. Nanda
JLab Liaison

Date _____