

SCIENTIFIC AND TECHNICAL COOPERATION

Experiments

**Protocol II Between the
UNITED STATES OF AMERICA
and the EUROPEAN ORGANIZATION FOR
NUCLEAR RESEARCH**

To Agreement of May 7, 2015

Signed at Geneva December 18, 2015



NOTE BY THE DEPARTMENT OF STATE

Pursuant to Public Law 89—497, approved July 8, 1966
(80 Stat. 271; 1 U.S.C. 113)—

“ . . .the Treaties and Other International Acts Series issued under the authority of the Secretary of State shall be competent evidence . . . of the treaties, international agreements other than treaties, and proclamations by the President of such treaties and international agreements other than treaties, as the case may be, therein contained, in all the courts of law and equity and of maritime jurisdiction, and in all the tribunals and public offices of the United States, and of the several States, without any further proof or authentication thereof.”

**EUROPEAN ORGANIZATION FOR
NUCLEAR RESEARCH**

**Scientific and Technical Cooperation:
Experiments**

*Protocol II to agreement of May 7, 2015.
Signed at Geneva December 18, 2015;
Entered into force December 18, 2015.*

EXPERIMENTS PROTOCOL II

between

**THE DEPARTMENT OF ENERGY
OF THE UNITED STATES OF AMERICA (DOE)**

and

**THE NATIONAL SCIENCE FOUNDATION
OF THE UNITED STATES OF AMERICA (NSF)**

and

**THE EUROPEAN ORGANIZATION
FOR NUCLEAR RESEARCH (CERN)**

to

THE CO-OPERATION AGREEMENT

concerning

**SCIENTIFIC AND TECHNICAL CO-OPERATION
IN NUCLEAR AND PARTICLE PHYSICS**

2015

The Department of Energy of the United States of America ("DOE"),

and

The National Science Foundation of the United States of America ("NSF"),

on the one hand,

and

The European Organization for Nuclear Research ("CERN"), an Intergovernmental Organization having its seat at Geneva, Switzerland,

on the other hand,

(hereafter collectively referred to as "the Parties"):

CONSIDERING:

That the Parties collaborated to their mutual benefit under the International Co-Operation Agreement Concerning Scientific and Technical Co-Operation on Large Hadron Collider (LHC) Activities signed December 8, 1997;

That the Parties successfully collaborated in the design, fabrication, and operation of the two major detector facilities, ATLAS and CMS, under an Experiments Protocol I signed December 19, 1997;

That the Parties renewed their collaboration under the Co-Operation Agreement Concerning Scientific and Technical Co-Operation in Nuclear and Particle Physics signed May 7, 2015 (hereinafter the "2015 Co-Operation Agreement");

That United States universities and national laboratories play a major role in the ongoing exploitation of the ATLAS and CMS detectors;

That at the same time the participation of U.S. scientists benefits the CERN program by providing intellectual and financial resources that allow substantial improvement in the capabilities of the detectors, and therefore a

greatly enhanced research program at the "energy frontier" of elementary particle physics;

That the excellent experimental results obtained so far strongly support revising the ATLAS and CMS performance reach for particle physics, and meeting the requirements commensurate with the LHC Accelerator increasing the nominal luminosity by a factor of ten;

That the construction and commissioning of the ATLAS and CMS detectors is to be completed through consolidation to its nominal performance; and

That it is in the mutual interest of the Parties to continue and extend their co-operation on the LHC experiments' consolidation plan and detector upgrades, under this Experiments Protocol II (hereinafter "Protocol"),

HAVE AGREED AS FOLLOWS:

Article 1 Purpose

The purpose of this Protocol is to define the framework under which DOE and NSF, the U.S. funding agencies, and their grantees and DOE national laboratories (hereinafter collectively referred to as the "U.S. Participants"), will participate in the particle physics programs in ATLAS and CMS detector collaborations under the auspices of CERN (hereinafter the "Collaborations"). These activities will include increasing significantly the physics reach of the detectors to the benefit of the LHC experiments through construction of technologically advanced detectors in order to take full advantage of the increase of the LHC accelerator's nominal luminosity by a factor of ten. The resulting increase in capabilities will facilitate and support the continued participation of the large United States particle physics community engaged at the LHC during the High-Luminosity LHC (hereinafter "HL-LHC") running period.

Article 2

Participation by U.S. Institutions in the Collaborations

Each Collaboration shall maintain a process, as defined in a Memorandum of Understanding, for admitting participating institutions which shall apply equally to both CERN Member States and non-Member States. DOE national laboratories and grantees of DOE and NSF, including partnering universities, will be entitled to participate in the Collaborations in accordance with applicable Memoranda of Understanding.

Article 3

Organization of U.S. Participants in the Collaborations

The U.S. particle physics Participants in each Collaboration shall form an organization (hereinafter "U.S. Collaboration Organization") to co-ordinate within the framework of the overall Collaboration of which they are an integral part. Each U.S. Collaboration Organization shall designate a national contact for DOE and for NSF, respectively, to represent the U.S. Collaboration Organization within its respective international Collaboration, and shall establish its own Project Management Plan, which will describe the U.S. Collaboration Organization and distribution of management responsibilities. The national contacts shall represent the U.S. Collaboration Organizations before DOE and NSF (hereinafter the "U.S. side"), and be responsible to the Collaborations for U.S. technical and budget-planning activities in particle physics.

Article 4

CERN LHC Resources Review Boards

The CERN LHC Resources Review Boards for the Collaborations, composed of representatives of each participating funding agency, shall monitor and oversee resource-related matters concerning implementation of this Protocol. DOE and NSF shall be full members of these LHC Resources Review Boards.

Article 5

Memoranda of Understanding

The final responsibilities for the construction of the ATLAS and CMS detector upgrades for the HL-LHC shall be specified in Memoranda of Understanding ("MOUs"), one per experiment, with the concurrence of the CERN LHC Resources Review Boards. Subsystem Technical Design Reports on the scientific and technical aspects of the detectors shall be submitted by the Collaborations to CERN for approval and shall be the basis for the commitments specified in the MOUs. Each MOU shall cover the actual construction of the relevant detector and its installation in the underground experimental area, and shall include the distribution of tasks and other responsibilities for all participating institutions, including those from the United States, as well as the organizational, managerial, and financial guidelines to be followed by each Collaboration.

Article 6

Responsibilities of U.S. Participants in the Collaborations

- 6.1 The U.S. Participants shall have responsibilities for R&D, engineering design, prototyping, fabrication, and normal maintenance and operation of detector subsystems and components, as agreed to and described in the MOUs and their addenda.
- 6.2 The U.S. Participants shall provide specified equipment to be built by or under the supervision of U.S. institutions for the HL-LHC upgrades to the ATLAS and CMS detectors. They shall also contribute, in whole or in part, to the provision of items of a largely industrial nature considered as part of common projects which are the responsibility of the overall Collaboration (hereafter "Common Projects"). Such items shall be funded directly or indirectly by all participants in the Collaborations, in accordance with the provisions of the MOUs, and their provision shall be subject to the approval of the CERN LHC Resources Review Boards.
- 6.3 Requirements for cash contributions from U.S. Participants in the Collaborations, including contributions to "Common Funds" for costs associated with Common Projects, shall be specified in the MOUs.

Responsibility for such contributions shall be in accordance with Article 7 below, and shall be limited to the amounts stated in the MOUs, except by mutual agreement among CERN, the Collaborations, and the U.S. side.

Article 7

Funding of U.S. Participation in the Collaborations

- 7.1 The U.S. Participants shall contribute their expertise and resources to the detector research, development and construction phases of the HL-LHC detector upgrades of the ATLAS and CMS detectors. Subject to availability of appropriated funds, DOE's and NSF's total contributions to the HL-LHC Upgrade Program shall be specified and incorporated under separate implementing arrangements in the form of Addenda to this Protocol, and shall also be detailed in provisions of the MOUs concerned. DOE and NSF shall each be responsible for their respective funding commitments. The application of any funds specified in these Addenda to the detector system costs will follow standard DOE and NSF accounting practices.
- 7.2 Detector system cost estimates presented to and reviewed by CERN will utilize CERN accounting policies and practices. The U.S. side will assume no responsibility with respect to the validity of such cost estimates for the U.S. Participants' contributions.
- 7.3 Funds provided by U.S. Participants under this Protocol for ATLAS and CMS detector upgrades shall only be used for those U.S. responsibilities identified in Article 6 above and the associated MOUs.

Article 8

Responsibilities of CERN

- 8.1 The general obligations of CERN as host laboratory, and of the participating institutions, are specified in the document "General Conditions Applicable to Experiments at CERN", which is hereby incorporated by reference and considered a part of this Protocol. The

Financial Guidelines for LHC Collaborations (CERN/FC/3796 and CERN/FC/3796/Rev.; original dated September 14, 1995, revised September 4, 1998) is also considered a part of this Protocol.

- 8.2 The Parties understand that the design, fabrication, and operation of the detectors shall be managed by the Collaborations, respectively, with CERN having oversight responsibilities and providing continuous monitoring through CERN's Research Board and its LHC Experiments Committee. The Research Board is responsible for the oversight of CERN's research programs and is chaired by the Director-General, whereas the LHC Experiments Committee reviews the scientific and technical progress of the LHC experiments, and reports to the Research Board.
- 8.3 The Technical Co-ordinators of the Collaborations shall be CERN staff members, and shall have overall responsibilities for technical aspects of detector construction. Their responsibilities shall include integration of the subdetectors, safety, infrastructure at CERN, surface and experimental areas, services, installation, machine interface, and test beams.
- 8.4 Similarly, the Resource Co-ordinators of the Collaborations shall be CERN staff members, and shall have the responsibility for monitoring the financial aspects of the detector projects, including budget and resource planning and the MOUs, as well as the responsibility for the financial aspects of the Common Projects and associated Common Funds.
- 8.5 CERN shall have the responsibility to approve the appointments of the Technical and Resource Co-ordinators, and to ensure that they have the staff and engineering support required to carry out their responsibilities. It shall be CERN's overall responsibility to use reasonable efforts to ensure that there is a satisfactory match between the available resources (including funding and manpower) and the approved detector projects. CERN, through the Resource and Technical Co-ordinators, shall have oversight responsibility for Common Projects and Common Funds.

Article 9

CERN Support for U.S. Scientists

CERN shall provide to U.S. scientists participating in the Collaborations on behalf of U.S. Participants the same level of facility support that it normally provides to all its visiting scientists.

Article 10

Entry into Force, Duration, and Termination

This Protocol shall enter into force upon signature by the Parties. This Protocol shall remain in force for an initial period of five years and shall thereafter be renewed automatically, each time for a new period of five years, unless a written notice of termination is given by one Party to the other Party, or the Parties have agreed on its renewal by another period, at least six months prior to the renewal date, so long as the 2015 Co-Operation Agreement remains in force.

Article 11

Amendment

The Parties may amend this Protocol at any time by mutual written consent, so long as the 2015 Co-Operation Agreement remains in force. Implementing arrangements in the form of Addenda to this Protocol, which shall be subject to formal review by the Government of the United States and by CERN, are the preferred vehicles for legally-binding alterations or additions.

Article 12

Final Provisions

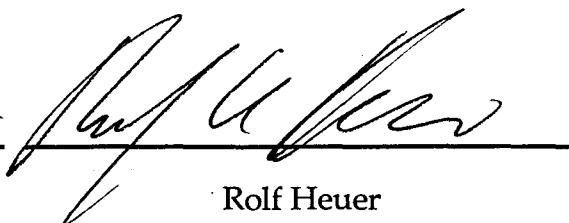
12.1 Each Party's participation in the activities contemplated by this Protocol is subject to the availability of appropriated funds, personnel, and other resources.

12.2 This Protocol is subject to and governed by the terms of the 2015 Co-Operation Agreement.

DONE at Geneva, Switzerland, in triplicate in the English language, on 18 December 2015

**FOR THE DEPARTMENT
OF ENERGY OF THE UNITED
STATES OF AMERICA:**

**FOR THE EUROPEAN
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RESEARCH:**



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