

**ADDENDUM**

**TO**

**THE MEMORANDUM FOR A MULTI-LATERAL  
COLLABORATION BETWEEN THE INSTITUTIONS  
AND FUNDING AGENCIES OF THE CTF3 COLLABORATION**

**CONCERNING**

**THE CONTRIBUTION OF THE SCHOOL OF PARTICLES  
AND ACCELERATORS OF THE INSTITUTE FOR RESEARCH IN  
FUNDAMENTAL SCIENCE ('IPM') RELATED TO RF DESIGN OF  
A TRAVELLING WAVE BUNCHER FOR THE CLIC DRIVE BEAM**

**2014**

## **ARTICLE 1**

### **Scope**

This Addendum defines the contribution of IPM to the RF design of a travelling wave buncher for the CLIC drive beam ('the Work'). It is understood and agreed that the execution of the activities under or related to this Addendum, including but not limited to the execution of payments, shall be subject to compliance with applicable law, including but not limited to export control and similar laws and regulations.

## **ARTICLE 2**

### **The Work**

- 2.1 IPM's shall design a traveling wave buncher fulfilling the requirements described in the conceptual design report of CLIC. The deliverable is a detailed 3D-RF design of the buncher, including couplers which can be used as a starting point for a mechanical design. The Work shall include studying the effects of beam loading, wakefields, higher order modes and shall include a sensitivity analysis for the key beam and geometrical parameters. In addition, some iteration will be needed, to be performed with the mechanical engineering team, in order to adapt the RF design to the mechanical requirements. The results shall be documented in a final report, including tables showing the detailed geometrical parameters of each cell of the buncher structure. CERN will use this design as input for the mechanical design, with the aim of realizing a prototype that can be tested with high power.
- 2.2 The Work shall be completed before the end of 2015. IPM shall not assign or sub-contract the Work without written permission by CERN as the Host Laboratory of the CTF3 Collaboration.

## **ARTICLE 3**

### **Monitoring of the Work**

Without diminishing IPM's responsibility for the correct performance of the Work, the execution of the Work shall be supervised and checked by a Technical Co-ordinator for each Party, as designated in article 5 of this Addendum. The Technical Coordinators shall:

- ensure that the Work is carried out in accordance with the provisions of this Addendum;
- agree on detailed activities and deliverables;
- address any technical issues encountered in the execution of this Addendum;

- agree on any modification of the Work, it being understood that if such a modification impacts on the financial envelope specified in article 4, its execution shall be subject to agreement between the parties with respect to a revised financial envelope, to be laid down in a written amendment to this Addendum;
- establish and communicate monthly progress reports.

#### **ARTICLE 4**

##### **Financial contribution by CERN**

CERN shall make the following financial contribution to the execution of the Work, payable to IPM:

- 40.000,- CHF shall be paid upon the conclusion of this Addendum;
- 25.000,- CHF shall be paid upon written acceptance by the Parties of a progress report, which shall be drawn up (approximately) six (6) months from the date of this Addendum;
- 10.000,- CHF shall be paid upon written acceptance by the Parties of the final report.

All amounts are net, firm and not subject to revision.

IPM shall invoice CERN, in duplicate. Payment shall be made by CERN within thirty (30) days from acceptance of the corresponding invoice by the CERN Technical Coordinator.

#### **ARTICLE 5**

##### **Coordination and correspondence**

The following persons (or their successors, as the case may be) shall act as Technical Coordinators for the implementation of this Addendum:

For CERN:

Steffen Doeberth  
CERN  
CH-1211 Geneva 23  
Switzerland  
e-mail: steffen.doeberth@cern.ch  
Phone: +41-22-767-2574

For IPM:

Hamed Shaker,  
School of Particles and Accelerators  
IPM  
Iran  
e-mail:hamed.shaker@cern.ch  
Phone: +41-22-767-8917

IPM shall send documents of a technical nature to the CERN Technical Coordinator and invoices to

CERN - Finance and Procurement Department  
Accounts payable  
CH-1211 Geneva 23  
Switzerland

CERN shall send all documents to:

Hessamaddin Arfaei  
School of Particles and Accelerators  
IPM  
Opposite the ARAJ, Artesh Highway,  
Tehran  
Iran  
e-mail: [arfaei@ipm.ir](mailto:arfaei@ipm.ir)

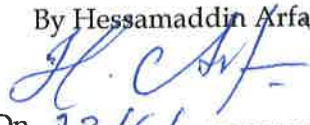
Done at Geneva and Tehran, in two copies in the English language,

For the European Organization  
for Nuclear Research (CERN), as the Host  
Laboratory of the CTF Collaboration

For the School of Particles and Accelerators  
of the Institute for Research in Fundamental  
Sciences (IPM)

  
by Steinar Stapnes

On...26/4.....2014

By Hessamaddin Arfaei  
  
On...23/6.....2014

