

**ADDENDUM**

**to**

**THE MEMORANDUM OF UNDERSTANDING  
FOR A MULTI-LATERAL COLLABORATION**

**between**

**THE INSTITUTIONS AND FUNDING  
AGENCIES OF THE CTF3 COLLABORATION**

**concerning**

**THE CONTRIBUTION OF  
KVI, GRONINGEN, TO THE CTF3 COLLABORATION**

**09/05/2011**

## CONSIDERING:

The Memorandum of Understanding (“the MoU”) defining the framework applicable to the construction of a 3<sup>rd</sup> generation Compact Linear Collider Test Facility (CTF3) and the performance of Experiments to demonstrate the feasibility of key issues of the CLIC scheme;

That Article 1.2 of the MoU envisages Addenda defining each contribution pledged to the CTF3 Collaboration,

**THE KVI, GRONINGEN, REPRESENTED BY KLAUS JUNGSMANN**, in its capacity as Member of the CTF3 Collaboration, **HEREWITH AGREES** to make the following contributions:


1. Joint effort to identify commercial X-band sources which can be used in the ZFEL linac, in high-power test stands for the CLIC study and for other X-band based projects. This effort will focus on commercial 5 MW range X-band klystrons. The initiative will be lead by KVI and will include other laboratories – both those interested in FEL projects and those associated with the CLIC study. This work package will begin immediately and produce a document summarizing the technical and commercial options by mid 2011.
2. Joint development of a baseline 70 MV/m-range accelerating structure for the ZFEL using the RF design tools developed in the context of the CLIC study. For CLIC this will give further information on the validity of the high-gradient concepts and spread the use of high-gradient X-band technology. A Groningen student will visit CERN to initiate the effort. The effort would begin in late 2011 with a final design produced by the end of 2012.
3. Accelerating structure fabrication studies. The first step in this work package is to familiarize KVI with the range of technology options available for high-gradient structure fabrication. KVI will investigate the cost optimum solution for their study. This will benefit CLIC in the long run by providing precise data on the performance and cost of a medium-series, approximately 20 structures, production run of high-gradient accelerating structures. This effort would begin in early 2012 after the general features of the RF design of the accelerating structure are known.
4. Joint development of X-band pulse compressors. Pulse compressors are integral elements in the RF power source networks of both the CLIC klystron-based test stands and the ZFEL linac. This work will proceed by an initial stay of a Groningen student at CERN for a period of time to be determined to learn the basic simulation tools and pulse concepts. This work package will begin immediately by investigating how to incorporate the Groningen effort into the ongoing effort at various labs.
5. Pulse compressor prototype fabrication. KVI will build a high-power prototype pulse compressor of a design to be determined based on the outcome of the previous study. The prototype will be available for test at the end of 2012 – consistent with the eventual delivery of X-band sources.
6. Joint study of high-power test stands based on the power source selected in work package 1. The objective is to arrive at a fully integrated layout and design, including all sub systems like the waveguide network, vacuum, cooling, instrumentation etc. The ZFEL needs such a test stand quite early in the project in order to validate RF components and to make reception testing of components. A very similar configuration will be used for the CLIC klystron-based high-power test stands. This design needs to be ready for the end of 2012.

The total resources associated with the contribution will be between two and four FTEyears in the period 2011-2013.

This Addendum shall form an integral part of the MoU.

Done in Geneva on:

For the KVI, Groningen, The  
Netherlands

  
09 Aug-2011  
(Klas P. Jungmann,  
Professor of Experimental Physics  
Director KVI )  
