**AMENDMENT 3**

**TO AGREEMENT ACT00001.0 of 16 September 2013**

On this day, month, and year, the following Parties:

**Lawrence Livermore National Security, LLC**, a limited liability company organized in the State of Delaware, having an administrative office at 2300 First Street, Suite 204, Livermore, CA 94550

represented by Dr. William Goldstein

(“**LLNS**”)

and

**Fyzikální ústav AV ČR, v. v. i.**, located at Na Slovance 2, 182 21 Praha 8, Id. No 68378271

represented by RNDr. Michael Prouza, Ph.D.

(“**IOP**”, “**CLIENT**”)

(collectively referred to as the "**Parties**")

have agreed on this Amendment of the AGREEMENT ACT00001.0 made between the Parties on 16 September 2013 (the “**Amendment**”):

**PREAMBLE**

1. On 16 September, 2013, the Parties entered into the AGREEMENT ACT00001.0, the subject of which is a development of High Repetition Rate Advanced Petawatt Laser System (the “**Agreement**” and the “**HAPLS”** or “**L3”**). The Agreement was awarded in accordance with the procurement procedure according to the Czech Republic Act No. 137/2006 Coll., on Public Procurement, as amended (the **“PPA”**).
2. **CLIENT** is seeking the most efficient as possible use of time before the commencement of installation of the L3-HAPLS laser system at the **CLIENT’S** facility (D8 Deliverable). With readiness of the laser building for installation of L3-HAPLS later than expected, **CLIENT’S** intention is to exploit **LLNS** experience in interfacing complex laser technology with facilities and infrastructures, in defining the validation procedures for individual technologies and in performing the corresponding validating processes. Further **CLIENT** is asking **LLNS** to provide its unique expertise in integration and commissioning of large aperture high-power vacuum laser pulse compressor systems and to assist **CLIENT** in integration, alignment and commissioning of the PW vacuum pulse compressor of the L3-HAPLS system.
3. Therefore, the **CLIENT** is requesting the below listed activities from **LLNS** to be performed prior or during the installation activities of the L3-HAPLS system at ELI-Beamlines (D8 Deliverable).
4. Parties also agree on the below mentioned arrangements for the case the **CLIENT’S** facility is not ready for deliverable D8 activities to be carried out by **LLNS** by September 30, 2017.
5. All terms used in the Amendment have the same meaning as used in the Agreement, unless expressly stipulated otherwise in the Amendment.
6. **THE PURPOSE AND SCOPE OF THE AMENDMENT**
7. The advisory and expert activities to be carried out by **LLNS** agreed hereunder involve the following within the following areas:
8. Facility readiness for installation and re-commissioning of the L3-HAPLS system

**LLNS** shall provide consulting and expertise in establishing readiness of the ELI-Beamlines facility to begin efficient installation and re-commissioning activities in September 2017. **LLNS** personnel will visit the ELI-Beamlines facility to participate in readiness evaluations and readiness reviews. **LLNS** shall provide detailed assessments and consult on preparations of detailed acceptance test plans for various facility interfaces with L3-HAPLS and for overall facility readiness.

1. Compressor integration with L3-HAPLS and ELI-Beamlines facility

Integration of the ELI-Beamlines-provided compressor into the facility and with L3-HAPLS is a major undertaking. Detailed plans are required for both. **LLNS** will assist in the detailed and explicit definition of the interface of the compressor and compressor gratings with L3-HAPLS. This work will include defining test plans for utilizing the PAD to diagnose the compressed beam out of the compressor, optical transport of laser pulses from the laser output to the ELI provided pulse compressor, and provide recommendation on the compressor grating orientation.

1. Development of experimental setup and estimation of contrast contribution of large aperture, multi-slab Ti:Sapphire. **CLIENT** will deploy ELI-Beamlines personnel to LLNL to receive training and cooperate on the supporting experiments.

**LLNS** shall perform the following experimental work: (a) train ELI-Beamlines subject matter expert in setting up an experiment to measure the spatially resolved polarization rotation of the Ti:Sapphire amplifier slabs that impact the temporal contrast of the amplifier system. ELI-Beamlines will make available one set of L3-HAPLS beta amplifier spare slabs, LLNS will make available laboratory space to conduct the measurements; (b) jointly develop a performance model to estimate the temporal contrast contribution of large aperture, multi-slab Ti:Sapphire amplifiers due to localized polarization rotation; (c) generate a report that summarizes the experimental and performance model results.

1. Outputs of individual activities listed above under par. 1.1.1. – 1.1.3. carried out by **LLNS** shall be reported in separate reports.
2. **ADDITIONAL FUNDING LEVEL AND PAYMENT CONDITIONS**

Parties agreed that Article 4.A. of the Agreement shall be extended by the following new wording, (that shall apply in addition to the existing wording in Article 4.A. and shall not replace that wording):

*“The funding required for the complete scope of work defined by Amendment 3 is in addition to the funding levels shown in Article 4.A of the Agreement, the funding level shown in Article 5 of Amendment 1 of the Agreement and the funding level shown in Article 5 of Amendment 2 of the Agreement. The additional funding level to* ***LLNS*** *for the work to be performed under Amendment 3 is not to exceed 5,700,000 Czech Koruna (CZK). The amount is net of value added tax which shall be payable according to the applicable legal regulation.”*

Additional funding shall be paid by **CLIENT** upon an invoice from **LLNS. LLNS** is entitled to issue the invoiceafter handover and acceptance of the last report made in accordance with Article 1.2 hereof to the **CLIENT** but no sooner than on February 15, 2018. The due period is 30 days from the receipt of the invoice by the **CLIENT**.

1. **DELIVERY SCHEDULE MODIFICATIONS**
   1. Parties agreed that due to temporary unavailability of the **CLIENT’S** facility (the relevant premises will not be ready for Deliverable D8 performance before September 30, 2017) the D8 Deliverable Completion Date and corresponding Payment Date are hereby postponed to June 30, 2018. **LLNS** will require no additional costs associated with this postponement if the **CLIENT’S** facility is fully ready for D8 performance within the above-mentioned date, i.e. by September 30, 2017.
   2. Should the **CLIENT’S** facility not be ready for beginning of D8 Deliverable performance (i.e. installation of the L3-HAPLS system) by September 30, 2017, the scope of D8 Deliverable will be automatically (i.e. without the need for any further amendment to the Agreement) reduced to comprise only such works and outputs that are feasible in the period of time between the moment of actual availability of the **CLIENT’S** facility and June 30, 2018 and only such works and outputs that are feasible within the already agreed overall funding for the HAPLS project in accordance with the Agreement (i.e., LLNS will not be required to incur costs over and above the modified funding level provided under this Amendment 3). The Parties will confirm the details of such modifications in a Technical Query document to be signed by both parties.

If the Technical Query document setting out the details of the above modifications is not signed by both Parties within 30 days of the moment of the **CLIENT’S** facility readiness for the commencement of the deliverable D8 activities, the Agreement shall terminate with *ex nunc* effect. In any event the Agreement shall terminate with *ex nunc* effect if the **CLIENT’S** facility is not ready for the commencement of the deliverable D8 activities by November 30, 2017.

1. **FINAL PROVISIONS**
   1. This Amendment comes into force and effects on the date of conclusion hereof.
   2. No other modifications, alterations, or interpretations to the Agreement are intended or implied by this Amendment. All existing clauses of the aforementioned Agreement, including Appendices, remain in effect, unless expressly modified or replaced through this Amendment.
   3. This Amendment has been executed in four counterparts whereas each Party receives two counterparts.

| **FYZIKÁLNÍ ÚSTAV AV ČR, V. V. I. (Institute of Physics at the Academy of Sciences of the Czech Republic) [CLIENT]**  By\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Title \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **LAWRENCE LIVERMORE NATIONAL**  **SECURITY, LLC**  **[LLNS]**  By\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Title \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
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