



EVROPSKÁ UNIE
EVROPSKÝ FOND PRO REGIONÁLNÍ ROZVOJ
INVESTICE DO VAŠÍ BUDOUCNOSTI



In Prague, 30th July 2010
Ref. no. FZU/ELI-171/2010

TENDER DOCUMENTATION

in the compliance with the provision of the Section 44 of the Act No. 137/2006, Coll., on the Public Contracts, as amended (hereinafter referred to as the “Act”)

for quotation processing for the public procurement for services announced in the simplified bellow the threshold with the procurement name:

“Conceptual design of multislab pump lasers for ELI for delivery of multi-PW beams scalable up to 10PW, numerical assessment of their performance for energy >100 J”

The financial means for this project shall be claimed from the “Research and Development for Innovations” Operational Programme (hereinafter referred to as “R&DI OP”) Priority Axis 1 – (“PA1”).

I. Identification data of the Contracting Authority:

Name: Fyzikální ústav AV ČR, v. v. i.
Registered office: Na Slovance 2, 182 21 Praha 8
Identification number: 68378271
VAT number: CZ68378271
Name and surname of the person entitled to act on behalf of the Contracting Authority: Doc. Jan Řídký, CSc. – director, or represented by statutory representative Prof. RNDr. Václav Janiš, DrSc
Contact person: Mgr. Petra Koutná Dušková, Ing. Bedřich Rus, Ph.D.
Telephone: 266052885, 266052871
E-mail: duskovap@fzu.cz, rus@fzu.cz

(hereinafter referred to as the “Contracting Authority”)

II. Name and description of the procurement:

2.1. Name of the procurement:

“Conceptual design of multislab pump lasers for ELI for delivery of multi-PW beams scalable up to 10PW, numerical assessment of their performance for energy >100 J “

2.2. Project description:

The Contracting Authority has been authorised to manage the implementation of the project of the International Laser Research Centre ELI (Extreme Light Infrastructure) in the Czech Republic (hereinafter referred to as “ELI Project”).

The ELI Project is one of the projects planned within the “ESFRI Roadmap”.

The main aim of the ELI Project is to create a modern facility and to implement a number of research and application projects focused on laser-matter interaction at a level of radiation intensity 100 times higher than the intensity reached by today’s lasers.

For the purposes of ELI Project the Contracting Authority has to ensure also services defined in this Article Sec. 2.3.

2.3. Description of the activities demanded by the Contracting Authority:

The purpose of this call for tenders is to conclude a contract for work with one Bidder (hereinafter referred to as the “Bidder” or the “Contractor”) which shall bind the Bidder to perform the following tasks for the Contracting Authority for the purposes of ELI Project:

- a) To perform a review study of individual technologies of multislab laser amplifiers, relevant to systems capable of providing nanosecond pulses with energy >1 J at the repetition rate of 10 Hz, capable of scaling up to >100 J at 10 Hz rep rate. The assumed layout of the laser amplifier is indicated in Annex 3 to this documentation.
- b) To design a baseline configuration of a multislab amplifier operating at 10 Hz repetition rate, based on Yb:YAG crystal and/or ceramics, capable to deliver pulses from the level of from 1 J up to 100 J and beyond. The design shall involve optimisation of the number of slabs and Yb doping level as a function of the output energy.
- c) To conduct a numerical study of absorption of the pumping radiation (assuming pump spectrum with central wavelength 930 to 940 nm) and of absorption of the ASE in large Yb:YAG multislab amplifiers, assuming the nominal size of the active medium $100 \times 100 \times 64 \text{ mm}^3$ (see Annex 3).
- d) To design layout of the optical system for transport of the pumping radiation from the laser diodes (assuming central wavelength 930 to 940 nm) to the active medium, providing its spatially homogeneous illumination, for amplifiers delivering output energy of at least 100 J (by using results obtained in point b) mentioned above); to analyze and numerically examine parameters of the designed optical pump system as a function of energy of the output pulse.

The Bidder shall submit all parts of work to the Contracting Authority in the form of the project technical reports.

The Bidder undertakes to carry out all works in accordance with valid law and according to instructions of the Contracting Authority.

Contact between the Contracting Authority and the Bidder shall be made in person, by e-mail and telephone; meetings will be necessary to take over and/or provide further specification to the documentation provided.

2.4. Classification of Subject-Matter of Public Contract:

Classification of Subject-Matter of Public Contract corresponds to item:

- Proposal and realisation of research and development
CPV code: 73300000-5.

III. Time and place of performance of procurement

The place of the performance of the procurement is the registered office of the Contracting Authority and any other places necessary for the performance of the procurement.

The period of the provision of services expires on 15 December 2010.

IV. Estimated value of the procurement

The estimated value of the procurement shall not exceed 4,980,000 CZK (four millions nine hundred and eighty thousand Czech Crowns), excluding VAT. It is a "below-the-threshold public contract" on services under Act.

V. Qualification prerequisites

5.1. The Bidder's tender must demonstrate the fulfilment of the **basic qualification prerequisites**. The basic qualification requirements are fulfilled by an Bidder who:

- a) has not been definitively convicted of a criminal offence committed for the benefit of an organized crime group, of a criminal offence involving participation in an organized crime group, legalisation of the proceeds of criminal activity, complicity, accepting bribes, bribery, indirect bribery, fraud, loan fraud, including the cases of preparation for and attempts to accessoryship in such a criminal offence, or if the conviction upon committing such a criminal offence has been expunged; this prerequisite shall be met by the statutory body or by each member of the statutory body in the case of a legal person and, in the case in which a legal person acts as a statutory body or a member of the statutory body of an Bidder, this prerequisite shall be met by the statutory body or by each member of the statutory body of such a legal person; if a tender or request to participate is submitted by a foreign legal person by means of its organisational branch, the prerequisite pursuant to this subparagraph shall also be met, as well as the stated persons, by the head of the organisational branch; such a basic qualification prerequisite shall be met by the Bidder both in relation to the territory of the Czech Republic and to the country of the registered office, place of business or residence thereof,
- b) has not been definitively convicted of a criminal offence in which the facts of the case are related to the object of the business activities of the Bidder under separate legal regulations or in which the conviction upon committing such a criminal offence has been expunged; this condition shall be met by the statutory body or by each member of the statutory body in the case of legal person, and in the case in which a legal person acts as a statutory body or a member of the statutory body of an Bidder, this prerequisite shall be met by the statutory body or by each member of the statutory body of such a legal person; if a tender or request to participate is submitted by a foreign legal person by means of its organisational branch, the prerequisite pursuant to this subparagraph shall also be met, as well as the stated persons, by the head of the organisational branch; such a basic qualifications prerequisite shall be met by the Bidder both in relation to the territory of the Czech Republic and to the country of the registered office, place of business or residence thereof,

- c) has not accomplished elements of unfair competition practices in the form of bribery under a separate legal regulation,
- d) is not or has not been subject to insolvency proceedings involving its assets, in which the declaration of bankruptcy has been issued or an insolvency petition has not been rejected due to a lack of assets on the part of the Bidder to cover the costs of insolvency proceedings, or the declaration of bankruptcy has not been set aside because of the Bidder's insufficient property or in respect of which the receivership has been imposed under a separate legal regulation,
- e) is not being wound up,
- f) has no outstanding tax arrears registered in tax records, either in the Czech Republic or in the country of the registered office, place of business or residence of an Bidder,
- g) has no outstanding arrears in respect of payments and penalties of public health insurance, either in the Czech Republic or in the country of the registered office, place of business or residence of an Bidder,
- h) has no outstanding arrears in respect of payments and penalties of the social security insurance and contribution to the State employment policy, either in the Czech Republic or in the country of the registered office, place of business or residence of an Bidder,
- i) has not been found guilty of grave professional misconduct in the 3 preceding years or has not been given a disciplinary punishment under separate legal regulations, in which the demonstration of professional qualifications under separate legal regulations is required pursuant to § 54(d); when the Bidder pursues such an activity through a person in authority or any other person liable for the activity of an Bidder, this prerequisite shall be applicable to those persons, and
- j) is not enrolled on the black list of Bidders banned from participating in the performance of public contracts.

The Bidder shall demonstrate the fulfilment of basic qualification prerequisites by supplying:

- a) **a solemn declaration** in accordance with § 53 (1) a) - j) of the Act, and in accordance with under § 62 (2) of the Act. The Bidder may use the solemn declaration document provided in Appendix 2 of the tender documentation.

5.2. The Bidder shall demonstrate in the tender the fulfilment of **professional qualification prerequisites**. The fulfilment of the professional qualification prerequisites is demonstrated by an Bidder, who shall submit

- a) **an extract from the Commercial Register**, if it is contained therein, or an extract from any other analogous register, if it is contained therein (a non-certified copy is sufficient),
- b) **evidence of possession of a licence to pursue business activities under separate legal regulations to the extent corresponding to the subject matter of the public contract** (a non-certified copy is sufficient).

5.3. The Bidder shall demonstrate in the tender the fulfilment of **technical qualification prerequisites** by supplying:

- a) **A list of principal services or projects realized within the past 3 years, and confirmed by a solemn declaration** stating their extent and the time of provision in accordance with Sec. 56 Art. 2 letter a) of the Act. This list will include the name of the procurement or project, the name of contracting authority, the place and time of fulfilment and the financial

value of the fulfillment. Attached to this list must be at least 3 references issued by a public contracting authority, if the services were provided to a public contracting authority, or a certificate issued by another person, if the services were provided to a person other than the public contracting authority. If the services were provided to a person other than the contracting authority and, simultaneously, if it is not possible to obtain a certificate from such a person for reasons on the part thereof, a solemn declaration of the Bidder may be used. A principal contract or a project may be considered as providing services similar to this tender, namely in the field of design and implementation of high-power nanosecond pulse lasers.

- b) **A list of minimum of three technicians and technical bodies** to be involved in the performance of the public contract, in accordance with Sec. 56 Art. 2 letter b) of the Act, in the form of solemn declaration.
- c) **A certificate of education and professional qualifications of the Bidder and those of the persons responsible for providing relevant services**, in accordance with Sec. 56 Art. 2 letter e) of the Act. the Contracting Authority requires the Bidder to have a working team of at least 3 persons performing the public contract, regardless of whether these persons are employees of the Bidder or whether they are in a different relation to the Bidder. These persons must have a university degree of a technical nature with a focus on laser physics or quantum electronics.

The Bidder shall demonstrate the fulfilment of this qualification prerequisite by submitting a list of the members of the team set up by the Bidder to perform the public contract and by submitting a structured curriculum vitae of each team member, with each curriculum vitae signed by the given member thus proving the minimum fulfilment qualification prerequisites. The Bidder must also submit a proof of education of all its team members (non-certified copy of a university diploma). The professional curricula vitae of all the team members shall include the following required data: educational achievement, overall length of working experience and length of experience in a field relevant to the position held under the contract (number of years). The Contracting Authority also requires that the Bidder's team leading researcher has had a minimum of 10 years experience in design and implementation of high-power laser systems.

5.4. The documents proving fulfilment of qualification prerequisites should be in their original or in a certified copy, unless the text of the tender document specifies differently.

5.5. A foreign Bidder shall demonstrate the fulfilment of qualification prerequisites in accordance with the legal system valid in the country of its registered office, place of business place or place of residence in the extent required by the Act on public contracts or by the Contracting Authority.

If a required document is not issued according to the law valid in the country of registered office, place of business or place of residence, the foreign Bidder is obliged to prove the fulfilment of this part of qualification by a solemn declaration.

If an obligation (which has to be proved in the qualification) is not defined in the country of registered office, place of business, or place of residence of the foreign Bidder, the Bidder shall prove this qualification by a solemn declaration.

5.6. Evidence demonstrating the fulfilment of the basic qualification prerequisites and the extract from the Commercial Register shall not date more than 90 calendar days from the last day on which the fulfilment of qualifications is to be demonstrated.

A foreign Bidder shall provide the evidence demonstrating the fulfilment of the basic qualification prerequisites in its original language with official Czech translation attached. If the evidence document is in English language, the official Czech translation is not required.

5.7. The Bidder shall make a written statement to confirm that all the data in the tender is true and that the Bidder has not withheld any relevant facts concerning the Bidder's capacity to perform the contract and is prepared to fulfil the conditions of the contract in a reliable manner and without delay.

VI. Calculation of the tender price and payment conditions

6.1. The tender price shall be quoted in Czech Crowns (CZK), separately excluding VAT, including VAT, and as a total price including VAT. The Bidder is required to specify the tender prices for individual parts of the work as divided in Section II, Article 2.3 a) to d) of this call for tenders, and also this individual parts of work divide into assumed men/hours with the rate of one hour.

The Contracting Authority requires having the total price for the complete supply specified in the tender.

The tender price shall include all the relevant costs on the part of the Bidder which are necessary for the performance of the public procurement.

The billing address is the address of the Contracting Authority:
Fyzikální ústav AV ČR, v. v. i., Na Slovance 2, 182 21 Praha 8.

6.2. The total agreed work price shall be paid to the Bidder in Czech Crowns (CZK).

The Bidder shall be entitled to invoice the Contracting Authority 30% of the total agreed work price after the signature of the relevant contract between the Contracting Authority and the Bidder, 40% of the total agreed work price after delivery of two parts of the work as described in Art. II Sec. 2.3 of this call for tenders to the Contracting Authority, and the last 30% of the total agreed work price after the date when the whole work defined in Art. II, Sec. 2.3., letter a) to d) shall be delivered to the Contracting authority.

The due date of the invoices is thirty (30) days from a date of their delivery to the Contracting Authority.

The Contracting Authority does not allow the advance payments.

VII. Deadline and place of tender submissions:

7.1. The tender shall be delivered by post or in person to the address of the registered office of the Contracting Authority. **The deadline for submissions is scheduled for 27th August 9.00 a.m.** The moment when the tender is received by the Contracting Authority is deemed as the

moment of submission.

7.2. The envelope containing the tender shall be properly sealed, bearing the address of the Bidder, and the name of the procurement shall be written on it visibly:

“Veřejná zakázka (The public tender) - “Conceptual design of multislab pump lasers for ELI for delivery of multi-PW beams scalable up to 10PW, numerical assessment of their performance for energy >100 J”- NEOTEVÍRAT (DO NOT OPEN).

7.3. The tender shall contain all the identification data of the Bidder, in particular: the business name, the address of the registered office, the identification number, and the person entitled to act on behalf of the Bidder or, if necessary, the person authorized to represent the Bidder and the contact address for written correspondence between the Bidder and the Contracting Authority.

7.4. The tender shall be written in Czech or English and shall include a draft contract signed by a person authorized to act on behalf of the Bidder or in the Bidder's name.

7.5. The Bidder shall submit the tender in duplicate, marked “Original” and “Copy” respectively. All sheets shall be firmly connected or stapled to prevent any sheet from being removed from the tender. All printouts shall be duly legible and the text shall not contain items crossed out or overwritten.

7.6. All the pages of the tender, or all the pages of the individual printouts, shall be numbered in continuous ascending order.

7.7. The Bidder shall also submit the tender in electronic form on a CD in a MS Office format or compatible or as a PDF file (this does not apply to evidence demonstrating the fulfilment of qualification prerequisites).

7.8. The tender shall be structured as follows:

- a) Cover sheet of the tender
The cover sheet shall include the following information: the name of the procurement, the basic identification data of the Contracting Authority and the Bidder (including the persons authorized to act), contact information (contact person for the given procurement, telephone number, e-mail etc.), the tender price not exceeding the estimated contract value, structured and quoted according to the tender documentation and the date and signature of the person entitled to act on behalf of the Bidder (use **Appendix 1** of this call for tenders)
- b) evidence demonstrating the fulfilment of the qualification prerequisites under Section V,
- in the case of the solemn declaration under Article 5.1 a) and j) the Bidder shall use **Appendix 2**, and another evidence in accordance with this tenders documentation,
- c) a draft contract signed by the person entitled to act on behalf of the Bidder or in the Bidder's name,

- d) a declaration confirming the tender as correct and binding, signed by the person entitled to act on behalf of the Bidder or in the Bidder's name.

VIII. Award period

The period throughout which the Bidders are bound by their tender expires on 27th November 2010. The award period shall run from the date of expiry of the time limit for the submission of tenders and cease to run on the date of delivery of the notice by the Contracting Authority of the selection of the most suitable tender. The award period shall be extended in respect of the Bidders that the Contracting Authority is entitled to conclude a contract with in compliance with this Act, until the conclusion of a contract or until the setting aside of the award procedure.

IX. Tender Evaluation Criteria

9.1 The tenders shall be evaluated by their economic advantageousness.

| | |
|--|------------------------|
| 9.2 Partial evaluation criterion: | relative weighting [%] |
| a. Overall tender price in CZK excluding VAT | 60 % |
| b. The quality of proposed services | 40 % |

Data for partial evaluation criteria and the means of evaluation:

To partial evaluation criterion a) – Overall tender price in CZK excluding VAT is being evaluated.

To partial evaluation criterion b) – Quality of proposed services.

Within the scope of this criterion assessment, the Contracting Authority will evaluate the quality of the overall concept of the proposed technical solution, technical level and complexity of proposed fulfilment and quality of methodology of proposed fulfilment. In the scope of this criterion the Contracting Authority shall evaluate: a) The quality of the proposed technical and technological concept of setting of this procurement, which the Bidder is required to describe to the Contracting Authority in the offer, which will contain the overall approach of the Bidder to fulfilment of the individual articles of a public contract (the maximal number of points for this criterion is 50), and b) the Bidder is required to detail the description of the management and organization of this procurement including the description of demands on cooperation with the Contracting Authority (the maximal number of points for this criterion is 50).

The subject of evaluation in the framework of this criterion will be:

- a) Objective understanding of the essence of expected solution, objective correctness of processing and interpretation of the proposal,
- b) Conceptual and technical level of the proposal adequate to the subject of work in accordance to the Art. 2 of this Call for tenders,
- c) Logical cohesion of individual parts of proposal.
- d) Technical details of individual parts of proposal.

9.3 The mode of evaluation of offers

The evaluation of offers will be made by point method, where each individual offer will receive in the frame of each criterion the value of points, which reflects the success of the offer in the frame of the criterion. Individual point values according to partial criteria will be multiplied by relative weight of the specific criterion. The sum of weighted point values of each offer will set order of results so that the most successful is the offer which received the highest sum of point values.

9.4 The Contracting Authority undertakes to use information provided in the bids solely to judge the merit of the proposals.

X. Business terms:

The Contracting Authority lays down the following basic business terms which shall be incorporated by the Bidder into the draft of contract for work:

The contract shall fulfil all the requirements of the Ministry of Education, Youth and Sports for the projects of the R&DI OP (PA1) as mentioned below – items d), e), g), h) and i).

- a) The draft contract shall not contradict or in essential way restrict the Contracting Authority's rights or requirements specified in this documentation.
- b) The draft contract shall be signed for the Bidder by a person entitled to act or by an attorney. In such cases, the original or an officially verified copy of the authorisation document shall be included in the draft contract.
- c) The draft contract shall bind the Bidder to perform and to handover the work as described in Article II Sec. 2.3 letter a) to d) of this call for tenders to the Contracting Authority by 15th December 2010.
- d) In the draft contract the Bidder shall state that according to Act no. 320/2001 Coll., Act on Financial Control Art. 2e), he as the chosen supplier is obliged to co-operate by execution of financial control.
- e) In the draft contract, the Bidder shall agree to be subject to audits by the Management Authority of the R&DI OP and will enable access even to those parts of bids, contracts and related documents, which are subject to protection according to special legal acts provided that conditions of legal acts are fulfilled. These audits will be applied for minimum of three years after termination of R&DI OP according to Art. 90 of the Council Regulation 1083/2006 e.g. at least to year 2021.
If part of the supply is provided by a Subcontractor, the Bidder is obliged to ensure fulfilment of obligations mentioned in this Article by the Subcontractor as well.
- f) If part of the public contract is provided by a subcontract, the Contracting Authority requires to state in the draft contract, which part will be provided by a third party and who will this be (the Bidder is obliged to state identification data of the Subcontractor). The Subcontractor can only be changed after written approval of the Contracting Authority.
- g) In compliance with the regulations of the Ministry of Education, Youth and Sports for the projects of the PA1 R&DI OP, the Bidder shall use a uniform system of identification for all

the accounting documents relating to the project and, more specifically, use a chosen identification sign (name of the project, registration number of the project).

- h) The Bidder shall indicate in the draft contract that the Contracting Authority has the right to withdraw from the contract without any penalty and to reduce the extent of supplies, should the Contracting Authority not be granted the subsidy for the performance of the contract or should the subsidy be reduced or postponed.
- i) The Bidder shall indicate in the draft contract that the Contracting Authority has the right to withdraw from the contract, if the costs which may arise from the contract for the Contracting Authority are found to be ineligible by the Management Body of the R&DI OP or by another auditing authority.
- j) The price and payment conditions in the draft contract shall comply with the requirements of Art. 6 of this Call for tenders.
- k) The contract draft must include a statement that the Bidder will provide to the Contracting Authority the non-transferable licence for use the result of work defined in Art. 2 of this tender documentation by the Contracting Authority itself and for the needs of the project ELI in the Czech Republic.
- l) Regulations of the contract which are not stipulated by these business terms shall be governed by Act no. 513/1991 Coll., Commercial Code, as amended.
- m) Potential disputes between the Contracting Authority and the Bidder shall be decided upon by the court which has jurisdiction in the place of the registered office of the Contracting Authority. Arbitration proceedings shall not be applied.

XI. Other information:

1. The Contracting Authority does not allow variants of this tender.
2. The chosen Bidder shall be called upon to conclude the contract.

XII. Opening of envelopes with tenders

Opening of envelopes with tenders will take place the **30th August at 1 p.m.** in the registered office of the Contracting Authority at the address Na Slovance 2, 182 21 Prague 8, room No. 117. The Bidders whose tenders have been delivered to the contracting entity within the time limit for the submission of the tender are entitled to take part in the opening of envelopes. At the opening of envelopes these participants have to prove themselves by the full powers drawn by the person authorized to act in the name of the Bidder.

Enclosure list:

- Cover sheet of the tender
- Solemn declaration
- Technical annex

Fyzikální ústav AV ČR, v. v. i.,


doc. Jan Řídký, CSc.

Director



Cover Sheet of the Tender

Basic data:

Name of public contract:

Contracting Authority: **Fyzikální ústav AV ČR, v. v. i.**

Registered office: Na Slovance 2, 182 21 Praha 8

Identification number: 68378271

Person entitled to act on behalf of the Contracting

Authority: doc. Jan Řídký, CSc., director

Contact person: Mgr. Petra Koutná Dušková

Telephone: 266 052 885

Fax: 286 890 265

E-mail: duskovap@fzu.cz

Bidder:

Registered office:

Identification number:

VAT number:

Person entitled to act on behalf of the Bidder:

Bank connection:

Persons authorized to represent:

Contact person:

Contact address:

Tel.:

E-mail:

Tender price:

Total price excluding VAT:

Total price including VAT:

.....
Business name – person entitled to act for the Bidder

(to be filled in by the Bidder)

Solemn declaration

under Act no. 137/2006 Coll., Act on Public Contracts (hereinafter referred to as "Act")

I hereby solemnly declare that:

- | | |
|-------------------------------|---|
| under § 53 (1) (a) of the Act | - that the member/s of the statutory body of the Bidder have not been finally convicted of a criminal offence committed for the benefit of a organized crime group, of a criminal offence of participation in a organized crime group, legalisation of proceeds of criminal activity, complicity, accepting bribes, bribery, indirect bribery, fraud, loan fraud, including the cases of preparation for and attempts of accessoryship in such a criminal offence, or if the conviction on committing such a criminal offence has been expunged |
| under § 53 (1) (b) of the Act | - that the member/s of the statutory body of the Bidder has not been finally convicted of a criminal offence, where the facts of the case are related to the object of business activities of the economic operator under separate legal regulations or where the conviction on committing such a criminal offence has been expunged |
| under § 53 (1) (c) of the Act | - the Bidder has not accomplished elements of unfair competition practices in the form of bribery under § 49 of the Commercial Code |
| under § 53 (1) (d) of the Act | - the Bidder is not or has not been subject to insolvency proceedings involving its assets, in which the declaration of bankruptcy has been issued or insolvency petition has not been rejected due to lack of assets on the part of the Bidder to cover the costs of insolvency proceedings, or the declaration of bankruptcy has not been set aside because of the Bidder's insufficient property or in respect of which the receivership has been imposed on under separate legal regulation |
| under § 53 (1) (e) of the Act | - the Bidder is not being wound up |
| under § 53 (1) (f) of the Act | - the Bidder has no outstanding tax arrears registered in tax records, both in the Czech Republic and in the country of the registered office, place of business or residence of an Bidder, |

- under § 53 (1) (g) of the Act - the Bidder has no outstanding arrears in respect of payments and penalties of public health insurance, both in the Czech Republic and in the country of the registered office, place of business or residence of an Bidder,
- under § 53 (1) (h) of the Act - the Bidder has not arrears in respect of the payment of the social policy and the state employment policy contributions, both in the Czech Republic and in the country of its registered office, place of business or residence,
- under § 53 (1) (i) of the Act - the Bidder has not been found guilty for grave professional misconduct in the preceding 3 years or has not been imposed a disciplinary punishment under separate legal regulations, where demonstration of professional qualifications under separate legal regulations is required pursuant to § 54(d); this prerequisite is fulfilled also by the person in authority and other persons liable for the activity of the Bidder,
- under § 53 (1) (j) of the Act - the Bidder does not appear on the black list of Bidders banned to participate in the performance of public contracts.

place..... date.....

.....

Business name – person entitled to act for the Bidder
(to be filled in by the Bidder)

Technical Annex

Conceptual design of multislab pump lasers for ELI for delivery of multi-PW beams scalable up to 10PW, numerical assessment of their performance for energy >100 J

Multislab pumping solid state lasers with a repetition rate of 10 Hz, using active gas cooling, are considered as the baseline system for generation of ultra-high power femtosecond pulses at the ELI-Beamlines facility. The layout of basic geometry of the multislab amplifier is shown in Fig.1.

The considered multislab lasers, which are the subject of the work required, should be pumped by laser diodes. The diode-pumped solid state laser (DPSSL) technology is intended to make it possible generating nanosecond pulses with energy of 500 J at the repetition rate of 10 Hz. The output beam of these laser units will be converted into the second harmonic frequency, corresponding to the baseline design wavelength of 515 nm. These second-harmonic beams will be employed for pumping broadband power amplifiers based on the OPCPA (optical parametric chirped-pulse amplification) technique or multipass amplifiers using Ti:Sapphire active medium.

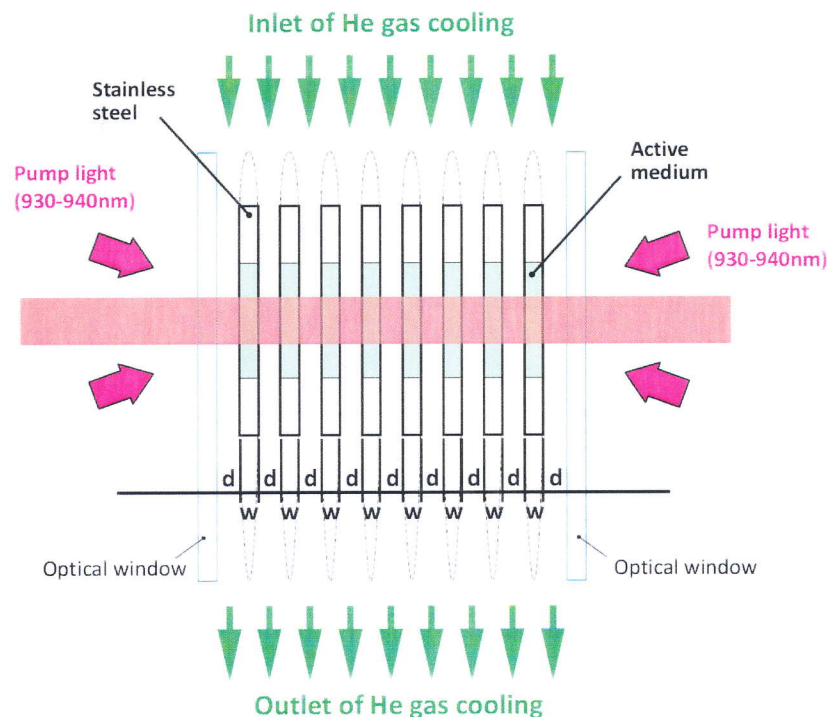


Fig.1. Baseline scheme of a multislab laser amplifier head using active cooling by helium gas (temperature -150 to -100° C). The active medium is pumped by ~ms light pulses generated by blocks of laser diodes providing typical spectrum of 930-940 nm. Candidate materials on the active medium are active Yb:YAG crystal or ceramics, Yb:CaF₂, Yb:LuAG, and Yb:GGG (gadolinium gallium garnet). The baseline medium required in this work is Yb:YAG. The total thickness of the active environment as a function of laser pulse energy and the doping profile of the crystal or ceramic matrix by active atoms (Yb) is the subject of the required work.

The first part of the development of diode-pumped laser systems for ELI-Beamlines will involve implementation of a prototype providing output pulses with energy of approximately 10 J. The proposed amplifier design must allow for testing of key system parameters and

verify its scalability towards higher output pulse energy (initially about 100 J and later up to 500 J, in one single beam).

One of the fundamental issues which have to be addressed in the designed multislab laser system, given the requirement for scalability to >100 J, is the acceptable energy loss in the active medium by the amplified spontaneous emission (ASE). As an illustration, Table 1 indicates the result of calculation carried out in IoP, aimed at the analysis of energy loss of the Yb:YAG active medium with size 10×10 cm², at two levels of pump energy (energy of the light from the pump diodes deposited in the quantum level system) of 500 J and 1000 J. Excessive energy losses by the amplified spontaneous emission can be avoided for instance by spatially varying the Yb doping profile and/or by operating the amplifier in the regime of low small-signal gain while using a sequence of two (or more) amplifiers.

| Pump fluence [J/cm ²] | ASE (edges) [J] | ASE (axial) [J] | Quantum defect [J] | Cumulated losses [J] | Extractable energy [J] |
|-----------------------------------|-----------------|-----------------|--------------------|----------------------|------------------------|
| 5 | 200 | 9 | 44 | 252 | 248 |
| 10 | 450 | 19 | 87 | 560 | 440 |

Table 1: Calculated total losses in Yb:YAG laser medium with size 10×10 cm² at the level of pump energy of 500 J and 1000 J. The calculation considers a system consisting of 8 slabs of Yb:YAG, each with a thickness of 8 mm.

Potential and functionality of the multislab laser architecture was demonstrated by the Mercury laser system implemented and operated at the Lawrence Livermore National Laboratory (see e.g. https://lasers.llnl.gov/programs/psa/fusion_energy/mercury.php <http://www-ferp.ucsd.edu/HAPL/MEETINGS/0204-HAPL/bibeau.pdf>). Amongst advantages of the multislab system is the possibility to choose the aspect ratio of the gain medium independently of the cooling requirements).

Example of a possible layout of the multislab laser amplifier head, cooled with helium gas at a temperature of -150 to -100 °C, is shown in Figure 2. It should be emphasized that the arrangement represented in Fig. 2 is only illustrative and does not include a system for transmission of the pumping light from laser diodes to the active medium.

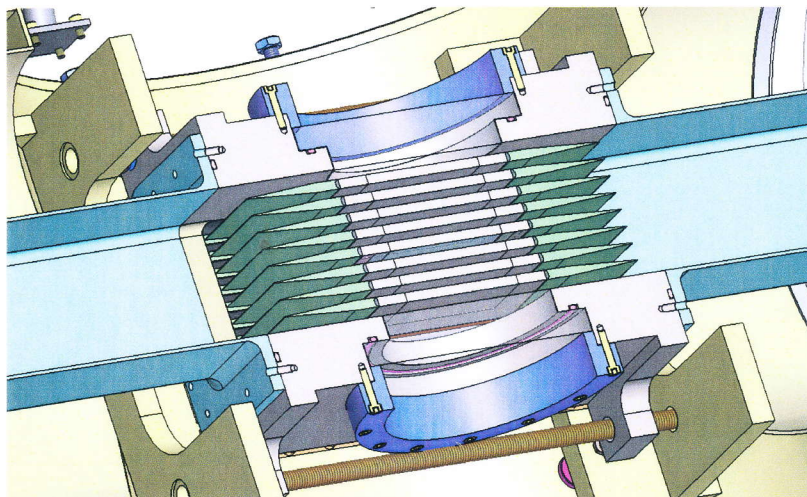


Fig. 2: Possible layout of multislab DPSSL amplifier head (Institute of Physics v.v.i.), involving 8 slabs of active medium. The represented scheme does not include the optical system for transmission of the pump signal, generated by blocks of laser diodes.

The multislab laser amplifier which is the subject of this work must be designed to meet the following parameters:

| | |
|-------------------------------|---|
| Pulse energy | 1 to 100 J (at the fundamental wavelength) |
| Scalability | >100 J |
| Repetition rate | 10 Hz |
| Pulse length | <5 ns |
| Output energy stability | better than +/- 10% |
| Beam optical quality | $M^2 < 2$ |
| Overall efficiency | > 5% (diode wall-plug to output laser pulse energy) |
| Take-off time | <30 min |
| Operation without maintenance | >100 000 pulses |