smlouva č. S17/217E

EUROPEAN UNION
European Structural and Investing Funds
Operational Programme Research,
Development and Education

MINISTRY OF EDUCATION, YOUTH AND SPORTS

FRAMEWORK PURCHASE CONTRACT

This framework purchase contract ("**Contract**") was concluded pursuant to section 2079 *et seq.* of the act no. 89/2012 Coll., Civil Code ("**Civil Code**") on the day, month and year stated below by and between:

(1) **Institute of Physics of the Academy of Sciences of the Czech Republic, a public research institution,**

with its registered office at:

Na Slovance 2, Praha 8, PSČ: 182 21,

registration no.: 68378271,

("**Buyer**"); and

(2) **OptiXs, s.r.o.,**

with its registered office at: Křivoklátská 37/3, Letňany, 199 00 Praha 9,

registration no.: 02016770,

represented by: Ing. Aleš Jandík, CEO

("**Seller**").

(The Buyer and the Seller are hereinafter jointly referred to as "**Parties**" and individually as "**Party**".)

WHEREAS

(A) The Buyer is a public contracting authority and the beneficiary of a grant of the Ministry of Education, Youth and Sports of the Czech Republic within the Operational Programme Research, Development and Education.

(B) The Buyer needs to purchase the Object of Purchase (as defined below) in accordance with the Act no. 134/2016 Coll., on Public Procurement.

(C) The Seller wishes to provide the Object of Purchase to the Buyer for consideration.

(D) The Seller's bid for the public procurement entitled "*Scientific grade cameras and spectrometers – Part C: Delivery of Large field-of-view imaging camera*", whose purpose was to procure the Object of Purchase ("**Public Procurement**"), was selected by the Buyer as the most suitable.

IT WAS AGREED AS FOLLOWS:

1. BASIC PROVISIONS

1.1 Under this Contract the Seller shall (for the whole duration of this Contract), on the basis of written requests, hand over to the Buyer camera, which shall meet requirements listed in Article 2.3 of the Annex 1 (*Technical Specification*) of this Contract ("**Object of Purchase**") and shall transfer to the Buyer ownership right to the Object of Purchase, and the Buyer shall take over the Object of

Purchase and shall pay the Seller the Purchase Price (as defined below), all under the terms and conditions stipulated in this Contract.

1.2 Under this Contract the Seller shall carry out following activities (**"Related Activities"**):

a) test and verify that the Object of Purchase meets all requirements stipulated in this Contract and provide the Buyer with the results;

b) verify that the Object of Purchase is fully functional;

c) transport the Object of Purchase to the place of delivery; and

d) cooperate with the Buyer during the performace of this Contract.

1.3 The Seller promises to the Buyer that if for the fulfillment of the requirements of the Buyer under this Contract or the proper operation of the Object of Purchase are necessary other deliveries and activities not expressly mentioned in this Contract, the Seller shall procure such deliveries or shall carry out such activities at its own expense without any effect on the Purchase Price.

1.4 The Object of Purchase shall be supplied new (not remanufactured).

1.5 To avoid any doubts Parties declare that devices described under Article 2.1 and 2.2 in the Annex 1 (*Technical Specification*) shall not be supplied under this Contract.

1.6 Technical parameters listed in Annex 1 (*Technical Specification*) are defined as maximal/minimal requirements, i.e. the Seller is entitled to offer more efficient product.

2. WRITTEN REQUESTS

2.1 The Seller shall supply the Object of Purchase on the basis of written request of the Buyer (**"Request"**).

2.2 In each Request the Buyer shall specify the quantity of the Objects of Purchase that the Buyer wishes to procure.

2.3 The Request is considered to be made in writing even if it was sent via email.

2.4 The expected quantites in Annex 2 (*Price sheet*) to this Contract are indicative only. Under this Contract the Buyer has no duty to order any minimum quantity of the Objects of Purchase.

3. THE PLACE OF DELIVERY

The place of delivery is at the address: ELI Beamlines, Průmyslová 836, post code 252 41, Dolní Břežany, Czech Republic or other address in Dolní Břežany specified by the Buyer prior to the delivery of Object of Purchase.

4. DURATION OF THE CONTRACT

4.1 This Contract is concluded for the period of 1 year.

5. THE TIME OF DELIVERY

5.1 The Seller shall deliver the Object of Purchase and shall carry out Related Activities within 12 weeks from the day, on which received the Request.

5.2 The Seller is entitled to handover the Object of Purchase during working days between 9:00 and 16:00 hours, unless otherwise agreed by the Parties. Exact working days shall be determined on the basis of mutual agreement. If the agreement is not reached, the Seller shall perform during the last day, on which it is possible to fulfill this Contract in time and the Buyer shall provide to the Seller for this purpose necessary cooperation.

6. THE OWNERSHIP RIGHT

The ownership right to the Object of Purchase shall be transferred to the Buyer upon the acceptance of the Object of Purchase.

7. PRICE AND PAYMENT TERMS

7.1 The purchase price of the Object of Purchase is stated in Annex 2 (*Price sheet*) to this Contract (**"Purchase Price"**). Value added tax shall be paid in accordance with the applicable legal regulations.

7.2 The Purchase Price cannot be exceeded and includes all costs and expenses of the Seller related to the performance of this Contract. The Purchase Price includes, among others, all expenses related to the handover of the Object of Purchase and execution of Related Activities, costs of copyright, insurance, customs, warranty service and any other costs and expenses connected with the performance of this Contract.

7.3 The Purchase Price for the Object of Purchase shall be paid in the currency specified in Annex 2 (*Price sheet*) to this Contract on the basis of a tax document – invoice, to the account of the Seller designated in the invoice.

7.4 The Purchase Price shall be paid in the following manner:

a) 50% of the Purchase Price shall be paid after the Buyer issues the Request;

b) 50% of the Purchase Price shall be paid after the Buyer accepts the Objects of Purchase.

7.5 The Buyer shall realize payments on the basis of duly issued invoices within 30 days from their receipt. The invoice shall be considered to be paid for on the day when the invoiced amount is deducted from the Buyer's account on behalf of the Seller's account.

7.6 The invoice issued by the Seller as a tax document must contain all information required by the applicable laws of the Czech Republic. Invoices issued by the Seller in accordance with this Contract shall contain in particular following information:

a) name and registered office of the Buyer,

b) tax identification number of the Buyer,

c) name and registered office of the Seller,

d) tax identification number of the Seller,

e) registration number of the tax document,

f) scope of the performance (including the reference to this Contract),

g) the date of the issue of the tax document,

h) the date of the fulfilment of the Contract,

i) Purchase Price,

j) registration number of this Contract, which the Buyer shall communicate to the Seller based on Seller's request before the issuance of the invoice,

k) declaration that the performance of the Contract is for the purposes of a project financed from the Operational Program Research, Development and Education. The title and the registration number of the project shall be communicated to the Seller at his request prior to issuing invoice and such title and the number of the project must be stated on the invoice.

7.7 In case that the invoice shall not contain the above mentioned information, the Buyer is entitled to return it to the Seller during it maturity period and this shall not be considered as a default. The new maturity period shall begin from the receipt of the supplemented or corrected invoice to the Buyer.

7.8 Last invoice of every calendar year must be delivered to the Buyer on December 15 of that calendar year, at the latest.

8. SELLER'S DUTIES

8.1 The Seller shall ensure that the Object of Purchase and Related Activities are in compliance with this Contract including all its annexes and applicable legal (e.g. safety), technical and quality norms.

8.2 During the performance of this Contract the Seller proceeds independently. If the Seller receives instructions from the Buyer, the Seller shall follow such instructions unless these are against the law or in contradiction to this Contract. If the Seller finds out or should have found out if professional care was exercised that the instructions are for any reason inappropriate or illegal or in contradiction to this Contract, then the Seller must notify the Buyer.

8.3 All things necessary for the performance of this Contract shall procure the Seller, unless this Contract stipulates otherwise.

9. ACCEPTANCE OF THE OBJECT OF PURCHASE

9.1 If the Object of Purchase does not meet requirements of this Contract, the Buyer is entitled to

refuse the acceptance of the Object of Purchase. In such a case the Seller shall remedy the deficiencies within 5 working days, unless Parties agree otherwise. The Buyer is entitled (but not obliged) to takeover the Object of Purchase despite the above mentioned deficiencies, in particular if such deficiencies do not prevent the Buyer in the proper use of the Object of Purchase. In such a case the Seller and the Buyer shall list the deficiencies, including the manner and the date of their removal (remedy). If the Parties do not reach agreement regarding the date of the removal, the Seller shall remove the deficiencies within 5 working days.

10. WARRANTY

10.1 The Seller shall provide a warranty of quality of the Object of Purchase for the period of 12 months. If on the warranty list or other document is the warranty period of longer duration, then this longer warranty period shall have priority over the period stated in this Contract.

10.2 The warranty period shall begin on the day of the acceptance of the Object of Purchase by the Buyer. If the Object of Purchase is accepted with deficiencies, the warranty period shall begin on the day, which follows the day, in which the last deficiency was removed.

10.3 The Seller shall remove defects that occur during the warranty period free of charge.

10.4 If the Buyer ascertains a defect of the Object of Purchase during the warranty period, the Buyer shall notify such defect without undue delay to the Seller. Defects may be notified on the last day of warranty period, at the latest.

10.5 The Buyer notifies defects in writing via e-mail. The Seller shall accept notifications of defects on the following e-mail address: servis@optixs.cz. The Seller shall confirm within 24 hours from the receipt of the notification.

10.6 In the notification the Buyer shall describe the defect and the manner of removal of the defect. The Buyer has the right to:

a) ask for the removal of the defect by the delivery of new Object of Purchase or its individual parts, or

b) ask for the removal of the defect by repair, or

c) ask for the reasonable reduction of the Purchase Price.

The choice among the above mentioned rights belongs to the Buyer, however, the Buyer shall take into consideration reasonable suggestions of the Seller. The Buyer is also entitled to withdraw from this Contract, if by delivering the Object of Purchase with defects this Contract is substantially breached.

10.7 The Seller shall remove the defect within 30 days from its notification, unless Parties agree otherwise.

10.8 The Seller shall remove the defect within terms stipulated in this Contract even if the notification of the defect is in his opinion unjustified. In such a case the Seller is entitled to ask for reimbursement of the costs of removal of the defect. If Parties disagree on whether the notification of the defect is justified or not, the Buyer shall ask an expert for the expert's opinion, which shall

determine whether the notification of the defect was justified or not. In the case that the expert shall consider the notification as justified, then the Seller shall bear costs of the expert's opinion. If the expert considers the notification to be unjustified, then the Buyer shall reimburse the Seller for verifiably and effectively incurred costs of removal of the defect.

10.9 Parties shall execute a protocol on the removal of the defect, which shall contain the description of the defect and the confirmation that the defect was removed. The warranty period shall be extended by a period of time that elapses between the notification of the defect until its removal.

10.10 In case that the Seller does not remove the defect within stipulated time or if the Seller refuses to remove the defect, then the Buyer is entitled to remove the defect at his own costs and the Seller shall reimburse these costs within 10 days after the Buyer's request to do so.

10.11 The warranty does not cover defects caused by unprofessional manipulation or by the failure to follow Seller's instructions for the operation and maintanence of the Object of Purchase.

11. PENALTIES

11.1 If the Seller is in default with the removal of the defect, the Seller shall pay to the Buyer a contractual penalty in the amount of 0,05% of the Purchase Price for every (even commenced) day of default.

11.2 The Seller shall pay contractual penalties within fifteen (15) days from the day, on which the Buyer enumerated its claims. The payment of contractual penalties shall not affect the right of the Buyer to damages even to the extent to which such damages exceeds the contractual penalty.

11.3 The Buyer is entitled to unilaterally set off claims arising from the contractual penalties against the claim of the Seller for the payment of the Purchase Price.

12. TERMINATION BY NOTICE

12.1 The Buyer is entitled to terminate this Contract by a written notice anytime without stating its reasons.

12.2 The notice period is one (1) month and shall start on the first day of the month that follows the month in which the Seller received the written notice.

13. RIGHT OF WITHDRAWAL

13.1 The Buyer is entitled to withdraw from this Contract or individual purchase contracts without any penalties, if any of the following circumstances occur:

d) the Seller shall be in delay with the fulfilment of this Contract (with the delivery of the Object of Purchase and execution of Related Activities) and such delay lasts more than 2 weeks;

e) the Object of Purchase does not meet requirements specified in Annex 1 (*Technical Specification*) to this Contract;

f) the insolvency proceeding is initiated against the Seller; or

g) the Buyer ascertains that the Seller provided in its bid for the Public Procurement information or documents that do not correspond to the reality and that had or could have had impact on the result of the award procedure, which preceded the conclusion of this Contract.

14. SPECIAL PROVISIONS

By signing this Contract, the Seller becomes a person that must cooperate during the finance control within the meaning of Section 2 letter e) of the act no. 320/2001 Coll., on finance control in the public administration, and shall provide to the Directing Body of the Operational Programme Research, Development and Education or other control bodies acces to all parts of the bid, Contract or other documents that are related to the legal relationship formed by this Contract. This duty also covers documents that are subject to the protection in accordance with other acts (business secrets, secret information, etc.) provided that control bodies fulfil requirements stipulated by these acts. The Seller shall secure that all its subcontractors are also obliged to cooperate with control bodies in the above stipulated extent. The possibility of effective control must be preserved until the year 2027.

15. CONFIDENTIALITY

Parties shall not disclose information that shall become available to them in connection with this Contract and its performance and whose disclosure could harm the other Party. Duties of the Parties ensuing for the applicable legal regulations remain unaffected. The Parties are particularly aware that the Contract including all its annexes and/or individual purchase orders or contracts must be made publicly available in the Register of contracts in accordance with the act no. 340/2015 Coll., on Regiter of contracts.

16. REPRESENTATIVES OF THE PARTIES

16.1 The Seller appoints following representatives for the communication with the Buyer:

In technical matters:

Name: Ing. Aleš Jandík, CEO

E-mail: jandik@optixs.cz

Tel.: +420 607 014 292

In contractual matters:

Name: Ing. Aleš Jandík, CEO

E-mail: jandik@optixs.cz

Tel.: +420 607 014 292

16.2 The Buyer appoints following representatives for the communication with the Seller:

In technical matters:

Jméno: Hannes Bohlin

E-mail: hannes.bohlin@eli-beams.eu

17. FINAL PROVISIONS

17.1 This Contract is governed by the laws of the Czech Republic, especially by the Civil Code.

17.2 All disputes arising out of this Contract or out of legal relations connected with this Contract shall be preferable settled by a mutual negotiation. In case that the dispute is not settled within sixty (60) days, such dispute shall be decided by courts of the Czech Republic in the procedure initiated by one of the Parties.

17.3 The Seller bears the risk of changed circumstances within the meaning of Section 1765 of the Civil Code.

17.4 The Seller takes into account that the Buyer is not in relation to this Contract an entrepreneur, nor the subject matter of this Contract is connected with the business activities of the Buyer.

17.5 The Seller is not entitled to set off any of its claims or his debtor's claims against the Buyer's claims. The Seller is not entitled to transfer its claims against Buyer that arose on the basis or in connection with this Contract on third parties. The Seller is not entitled to transfer rights and duties from this Contract or its part on third parties.

17.6 All modifications and supplements of this Contract must be in writing.

17.7 If any of provisions of this Contract are invalid or ineffective, the Parties are bound to change this Contract is such a way that the invalid or ineffective provision is replaced by a new provision that is valid and effective and to the maximum possible extent correspond to the original invalid or ineffective provision.

17.8 If any Party breaches any duty under this Contract and knows or should have known about such breach, it shall notify it to the other Party and shall warn such Party of possible consequences of the breach.

17.9 This Contract is executed in four (4) counterparts and every Party shall receive two (2) counterparts.

17.10 An integral part of this Contract is Annex 1 (*Technical Specification*) and Annex 2 (*Price sheet*). If in Annex 1 (*Technical Specification*) is used term "Contracting Authority", it is meant Buyer and by term "supplier" or "Supplier" is meant the Seller.

17.11 This Contract shall be valid on the date of the signature of both Parties and effective on the date, on which it is published in the Register of contracts in accordance with the Act no. 340/2015 Coll., on Register of contracts.

IN WITNESS WHEREOF attach Parties their handwritten signatures:

Buyer

Signature: _____

Name: RNDr. Michael Prouza, Ph.D.,

Position: director

Date: 14. 11. 2017

Fyzikální ústav AV ČR
veřejná výzkumná instituce
182 21 Praha 8, Na Slovance 2

Seller

Signature: _____

Name: Ing. Aleš Jandík

Position: CEO

Date: 10.11.2014

OptiXs s.r.o.
Křivoklátská 37, 199 00 Praha 9
IČ: 02016770 DIČ: CZ02016770
www.optixs.cz

ANNEX 1

TECHNICAL SPECIFICATION

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[RSD product category A]

Dpt. 92

Scientific grade cameras and spectrometers

TP17_063

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	Position	**Name**
Responsible person	Junior Researcher RP5	Singh Sushil Kumar
Prepared by	Junior Researcher RP5 Junior Researcher RP5	Singh Sushil Kumar Bohlin Hannes

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Reviewed By			
Name (Reviewer)	Position	Date	Signature
Batheja Deepak Kumar	Senior Researcher RP5	NOTICE (RSD product category A)	
Ladislav Půst	Manager installation of technology	NOTICE (RSD product category A)	
Pavel Korouš	Chief Engineer	NOTICE (RSD product category A)	
Petr Pivoňka	Control System Engineer	NOTICE (RSD product category A)	
Roman Kuřátko	Facility Manager	NOTICE (RSD product category A)	
Veronika Olšovcová	Safety Coordinator	NOTICE (RSD product category A)	
Viktor Fedosov	SE & Planning group leader; Quality Manager	NOTICE (RSD product category A)	
Weber Stefan Andreas	RP5 / RP6 Team Leader	NOTICE (RSD product category A)	

Approved by			
Name (Approver)	Position	Date	Signature
Georg Korn	Science and Technology Manager, Scientific coordinator of RP2-6		

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Table of Content

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1. Introduction

1.1. Purpose

This Requirements Specification Document (RSD) lists the technical requirements and constraints on products being purchased for the department 92 of ELI Beamlines project.

1.2. Scope

The RSD contains all of the technical requirements: functional, performance and design, delivery, safety and quality requirements for the following products: **Imaging spectrometers and scientific grade cameras** (*PBS code: E.E3.P3DG.3*).

These products are in product **Category A** according to the ELI Beamlines RSD categories of products. The Category A is an Off-the-shelf Product without necessity of modifications and necessity to be subjected to a verification program (review of design, inspection and testing) for ELI applications by the actual project specifications. All verification activities performing by a supplier shall be executed in accordance with the supplier's plan of outgoing inspection and tests. Internal Acceptance Procedure of the product Category A shall be established and applied before the product implementation (operation phase).

1.3. Terms, Definitions and Abbreviations

For the purpose of this document, the following abbreviated terms are applied:

Abbreviation	Meaning
AC	Alternating current
ADC	Analog-to-Digital Converter
CA	Contracting Authority (Institute of Physics AV CR, v. v. i.)
CCD	Charge-Coupled Device
CMOS	Complementary Metal Oxide Semiconductor
ELI	Extreme Light Infrastructure
EM	Electron multiplication
EMCCD	Electron Multiplying CCD
GigE	Gigabit Ethernet
PBS	Product Breakdown Structure
RSD	Requirements Specification Document
sCMOS	Scientific CMOS technology
SDK	Software Development Kit

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Abbreviation	Meaning
TTL	Transistor–Transistor Logic
USB	Universal Serial Bus
UV	UltraViolet

For the purpose of this document, the following terms and definitions are applied:

Term	Definition
Wavelength accuracy of a spectrometer	Wavelength accuracy of a spectrometer is defined as the difference between the predicted position of an emission line (as predicted by the spectrometer control software) and the measured peak position of the atomic emission line.
Wavelength reproducibility of a spectrometer	Wavelength reproducibility is defined as the maximum deviation in measurement of centroid of a particular spectral line during multiple scans (20 times). The wavelength range of the spectrometer shall be set moving from low wavelength to high wavelength (10 times) and moving from high wavelength to low wavelength (10 times).

1.4. References to standards

If this document includes references to standards or technical documents the CA allows/permits also another equal solution to be offered. If the Supplier offers another equal solution the CA shall not reject its bid, once the Supplier by appropriate means in the bid proves that the offered supplies, services or works meet in an equivalent manner the requirements including references to standards or technical documents.

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2. Functional, Performance and Design requirements

2.1. Tender part A - Imaging spectrometers

2.1.1. General requirements for all the spectrometers

2.1.1.1. Software and computer interface requirements

REQ-021493/A

The Supplier shall provide the required software for the spectrometers control, data acquisition and display.

REQ-021494/A

The software shall be able to run on Windows 10 operating system (or newer versions).

REQ-021598/A

The Supplier shall provide a software development kit (SDK) allowing programmatic control of full range of spectrometers settings and regimes and undepreciated raw image data acquisition.
NOTE 1: The SDK shall be compatible with Windows 10 and Centos 7 operating systems (or newer versions).
NOTE 2: The SDK shall be delivered in form of 64-bit linkable library binaries (.dll for Windows, .so for Linux), C/C++ header includes and full-scale documentation of all public library objects.

REQ-021495/A

The CA shall be able to install the software in any number of computers without incurring any additional costs.

REQ-021496/A

The control interface of the spectrometers shall be compatible with USB 3.0.

REQ-021498/A

The Supplier shall provide a cable in the range of 2 m to 3 m long for the control of the spectrometer.

2.1.1.2. Power supply

REQ-021497/A

All the spectrometers shall have power supply compatible with input Voltage in the range of 210–245 V AC at 50–60 Hz.

2.1.1.3. Turret interface

REQ-021508/A

The turret control of all the spectrometers shall be motorized.

REQ-021509/A

All the spectrometers and the turrets shall be designed such that the CA can replace/install a different turret in the future.

2.1.2. Turret and grating requirements for all the spectrometers

2.1.2.1. General requirements

REQ-021499/A

The Supplier shall provide 2 turrets that shall comply with the following specifications:

- **Turret #1** shall be compatible with imaging spectrometer #1;
- **Turret #2** shall be compatible with imaging spectrometers #2 and #3 (see chapters 2.1.4 and 2.1.5).

REQ-021500/A

The gratings shall be plane ruled reflectance grating.

2.1.2.2. Turret #1

REQ-021501/A

The turret shall house two gratings.

REQ-021502/A

The gratings shall have the following specifications:

(A) **Grating 1A** shall have a groove density of 150 lines/mm, blazed for 500 nm;

(B) **Grating 1B** shall have a groove density of 300 lines/mm, blazed for 422 nm.

REQ-021503/A

*The gratings **1A** and **1B** shall be coated with Aluminum coating.*

2.1.2.3. Turret #2

REQ-021504/A

The turret shall house three gratings.

REQ-021505/A

The gratings shall have the following specifications:

(A) **Grating 2A** shall have a groove density of 150 lines/mm, blazed for 500 nm;

(B) **Grating 2B** shall have a groove density of 300 lines/mm, blazed for 750 nm;

(C) **Grating 2C** shall have a groove density of 1200 lines/mm, blazed for 1000 nm.

REQ-021600/A

*The gratings **2A, 2B** and **2C** shall be coated with Aluminum coating.*

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2.1.3. Imaging Spectrometer #1

2.1.3.1. Focal length

REQ-021506/A

The spectrometer shall be designed in Czerny Turner configuration. The focal length of both the curved mirrors shall be between 175 ± 25 mm.

REQ-021507/A

The focusing optics and grating shall be such that the f-number at the input shall be between f/3.5 and f/4.1.

2.1.3.2. Wavelength accuracy

REQ-021510/A

The wavelength accuracy of the spectrometer #1 shall be equal or less than 0.25 nm, when used with a grating with groove density 1200 l/mm.

2.1.3.3. Wavelength repeatability

REQ-021511/A

The wavelength repeatability of the spectrometer #1 shall be less than 75 pm, when used with a grating with groove density 1200 l/mm.

2.1.3.4. Input port

REQ-021512/A

The spectrometer shall have one input port with motorized slit assembly.

2.1.3.5. Output ports

REQ-021513/A

The spectrometer shall have single output port.

REQ-021514/A

The output port shall be able to provide an imaging aperture of 25 x 10 mm.

REQ-021515/A

The Supplier shall provide a mechanical slit that can be attached to the output port.

2.1.3.6. Optics

REQ-021516/A

The optics within the spectrometer shall be Al+MgF_2 coated to enhance transmission in ultra violet region.

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2.1.4. Imaging Spectrometer #2

2.1.4.1. Focal length

REQ-021517/A

The spectrometer shall be designed in Czerny Turner configuration. The focal length of both the curved mirrors shall be between 500 ± 50 mm.

REQ-021518/A

The focusing optics and grating shall be such that the f-number at the input shall be between f/6 and f/7.

2.1.4.2. Wavelength accuracy

REQ-021521/A

The wavelength accuracy of the spectrometer #2 shall be equal or less than 0.2 nm, when used with a grating with groove density 1200 l/mm.

2.1.4.3. Wavelength repeatability

REQ-021522/A

The wavelength repeatability of the spectrometer #2 shall be less than 4 pm, when used with a grating with groove density 1200 l/mm.

2.1.4.4. Input port

REQ-021523/A

The spectrometer #2 shall have one input port with motorized slit assembly.

2.1.4.5. Output ports

REQ-021524/A

The spectrometer #2 shall have 2 output ports. The output port shall be selectable with a motorized mirror inside the spectrometer.

REQ-021525/A

Each of the spectrometer #2 output port shall be able to provide an imaging aperture of 30 x 14 mm.

REQ-021526/A

The Supplier shall provide a mechanical slit that can be attached to one of the output ports.

2.1.4.6. Optics

REQ-021527/A

The optics within the spectrometer #2 shall be silver coated to enhance transmission in Visible and Near Infra-red region.

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2.1.5. Imaging Spectrometer #3

2.1.5.1. Focal length

REQ-021528/A

The spectrometer shall be designed in Czerny Turner configuration. The focal length of both the curved mirrors shall be between 750 ± 50 mm.

REQ-021529/A

The focusing optics and grating shall be such that the f-number at the input shall be between f/9.0 and f/10.5.

2.1.5.2. Wavelength accuracy

REQ-021532/A

The wavelength accuracy of the spectrometer #3 shall be equal or less than 0.2 nm, when used with a grating with groove density 1200 l/mm.

2.1.5.3. Wavelength repeatability

REQ-021533/A

The wavelength repeatability of the spectrometer #3 shall be equal or less than 10 pm, when used with a grating with groove density 1200 l/mm.

2.1.5.4. Input port

REQ-021534/A

The spectrometer #3 shall have one input port with motorized slit assembly.

2.1.5.5. Output ports

REQ-021535/A

The spectrometer #3 shall have 2 output ports. The output port shall be selectable with a motorized mirror inside the spectrometer.

REQ-021536/A

Each of the output port shall be able to provide an imaging aperture of 30 x 14 mm.

REQ-021537/A

The Supplier shall provide a mechanical slit that can be attached to one of the output ports.

2.1.5.6. Optics

REQ-021538/A

The optics within the spectrometer shall be silver coated to enhance transmission in Visible and Near Infra-red region.

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2.1.6. Camera for the Spectrometers

2.1.6.1. General requirements

REQ-021539/A

The parameters of all the cameras for the spectrometers (see chapters 2.1.3, 2.1.4 and 2.1.5) shall correspond to the requirements given in table 1 below.

Item N°	Parameters	Minimum Requirements
1.1	Anti-reflection coating	UV coating (QE ≥ 35 % at 250 nm)
1.2	Sensor type	Back illuminated EMCCD with fringe suppression technology
1.3	Fringe suppression	Intensity fluctuation resulting from interference should be reduced to max. ±20% (peak-to-peak) in the wavelength range 250 nm – 1000 nm
1.4	Pixel format	1600 x 400 pixels
1.5	Pixel size	16 x 16 µm
1.6	Sensor area	25.6 x 6.4 mm
1.7	Linearity	≥ 99 % at 1MHz readout rate
1.8	Quantum efficiency	≥ 95 % at maximum (peak located in 500-800 nm range), ≥ 35 % at 250 nm
1.9	Spectrometric well capacity	≥ 200,000 electrons
1.10	Readout noise	≤ 25 electrons/pixel/s (typical) in EM mode at 1MHz readout rate
1.11	Dark current	< 0.01 electrons/pixel/s
1.12	Clock-induced charge	< 0.02 electrons/pixel/frame
1.13	Binning	Should be selectable
1.14	Readout interface	USB version 2.0 or higher, or GigE
1.15	Trigger input	Fiber optic or TTL
1.16	ADC resolution	≥ 16 bit
1.17	Cooling	Thermoelectric

Table 1: Functional and performance parameters of the cameras for spectrometers.

2.1.6.1.1. Camera interface requirements

REQ-021614/A

The Supplier shall provide the relevant hardware required to install the camera on any of the spectrometers described in the previous sections.

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2.2. Tender part B – sCMOS scientific imaging camera

2.2.1. General requirements

REQ-021540/A

The parameters of all the sCMOS scientific imaging cameras shall correspond to the requirements given in table 2 below.

Item N°	Parameters	Minimum Requirements
2.1	Sensor type	sCMOS
2.2	Pixel format	2048 × 2048 pixels
2.3	Pixel size	6.5 x 6.5 µm
2.4	Sensor area	13.3 × 13.3 mm
2.5	Linearity	≥ 99 %
2.6	Quantum efficiency	≥ 80 % (peak)
2.7	Full well capacity	≥ 30,000 electrons
2.8	Readout noise	< 1.0 electrons (median)
2.9	Dark current	< 0.02 electrons/pixel/s
2.10	Dynamic range	≥ 33,000:1
2.11	Readout interface	USB3.0
2.12	ADC resolution	≥ 16 bit
2.13	Trigger input	Fiber optic or TTL
2.14	Optical interface	C-mount
2.15	Cooling	Thermoelectric

Table 2: Functional and performance parameters of the sCMOS scientific imaging camera.

2.2.1.1. Software and computer interface requirements

REQ-021615/A

The Supplier shall provide the required software for camera control, data acquisition and display.

REQ-021616/A

The software shall be able to run on Windows 10 operating system (or newer versions).

REQ-021617/A

The Supplier shall provide a software development kit (SDK) allowing programmatic control of full range of camera settings and regimes and undepreciated raw image data acquisition.
NOTE 1: The SDK shall be compatible with Windows 10 and Centos 7 operating systems (or newer versions).
NOTE 2: The SDK shall be delivered in form of 64-bit linkable library binaries (.dll for Windows, .so for Linux), C/C++ header includes and full-scale documentation of all public library objects.

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REQ-021618/A

The CA shall be able to install the software in any number of computers without incurring any additional costs.

REQ-021619/A

The Supplier shall provide a cable between 2 m to 3 m long for the control of the camera.

2.3. Tender part C – Large field-of-view imaging camera

2.3.1. General requirements

REQ-021541/A

The parameters of all the large field-of-view imaging cameras shall correspond to the requirements given in table 3 below.

Item N°	Parameters	Minimum Requirements
3.1	Sensor type	CCD or sCMOS
3.2	Pixel format	≥ 4096 x 4096 pixels
3.3	Pixel size	9 x 9 µm
3.4	Sensor area	≥ 36.8 x 36.8 mm
3.5	Linearity	≥ 99 %
3.6	Quantum efficiency	≥ 60 % (peak)
3.7	Full well capacity	≥ 90,000
3.8	Readout noise	< 10 electrons
3.9	Dark current	< 0.02 electrons/pixel/s
3.10	Dynamic range	≥ 9,800:1
3.11	Readout interface	USB or Ethernet
3.12	ADC resolution	≥ 16 bit
3.13	Cooling	Thermoelectric

Table 3: Functional and performance parameters of the large field-of-view imaging camera.

2.3.1.1. Software and computer interface requirements

REQ-021620/A

The Supplier shall provide the required software for camera control, data acquisition and display.

REQ-021621/A

The software shall be able to run on Windows 10 operating system (or newer versions).

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REQ-021622/A

The Supplier shall provide a software development kit (SDK) allowing programmatic control of full range of camera settings and regimes and undepreciated raw image data acquisition.
NOTE 1: The SDK shall be compatible with Windows 10 and Centos 7 operating systems (or newer versions).
NOTE 2: The SDK shall be delivered in form of 64-bit linkable library binaries (.dll for Windows, .so for Linux), C/C++ header includes and full-scale documentation of all public library objects.

REQ-021623/A

The CA shall be able to install the software in any number of computers without incurring any additional costs.

REQ-021624/A

The Supplier shall provide a cable between 2 m to 3 m long for the control of the camera.

3. Delivery requirements

REQ-021602/A

The transportation to the final destination shall be conducted by the Supplier.

4. Safety Requirements

REQ-021603/A

The Supplier shall supply a Declaration of Conformity or any other equivalent document legally recognized and accepted in the Czech Republic for each product type if the appropriate legislation determines the Supplier's obligation to have a Declaration of Conformity (or the equivalent document) for the purposes of a Device sale in the Czech Republic to fulfil the requirements of 2001/95/EC directive or applicable Czech law.

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5. Quality Requirements

5.1. General Quality Requirements

REQ-021604/A

The Supplier shall provide the Product User Manual as part of the delivered Product. The Manual shall include the instructions and descriptions regarding the following procedures:

- transport, handling and storage;
- installation, cleaning and calibration;
- user manual for the software;
- safe operation and maintenance procedures.

NOTE 1: The Product technical data sheet shall be part of manual.
NOTE 2: The scope of the User Manual shall be agreed with the CA before Product delivery.

REQ-021605/A

The Supplier shall establish and maintain a non-conformance control system compatible with ČSN EN ISO 9001 (equivalent to EN ISO 9001).

5.2. Specific Quality requirements

REQ-021606/A

In case of the spectrometer repair by the Supplier within the validity of warranty, the Supplier shall recalibrate and verify the spectrometer once the repair is completed. The results of these processes shall be provided to the CA.

REQ-021607/A

All the spectrometers shall be delivered with documented results of the Supplier's outgoing check (e.g. test protocols, inspection report and etc.).
NOTE 1: These results shall demonstrate that the spectrometers comply with technical requirements stipulated herein.
NOTE 2: The test equipment used for performing the tests shall have valid metrological confirmation.

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ANNEX 2

PRICE SHEET

Price sheet - Part C

Description	unit	expected quantity	Price/1pc exluded VAT	Total price exluded VAT
Large field-of-view imaging camera	pcs	1	15888	15 888,00 €
Total bid price				**15 888,00 €**