

**INDIAN INSTITUTE OF SCIENCE EDUCATION AND  
RESEARCH-THIRUVANANTHAPURAM**  
**[IISER-TVM]**

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IISER/PUR/PT/12/10

Date: 11<sup>th</sup> October 2010

**INVITATION TO TENDER**

Dear Sirs,

**SUB: FEMTOSECOND LASER AMPLIFIER SYSTEM**

Sealed **TWO - PART** Tenders are invited for above item as per **SCHEDULE** attached. **Instructions to Tenderers [Indigenous & Imports]** are also attached.

**The due date for receipt of Tenders is 08<sup>TH</sup> NOVEMBER 2010. Late and delayed offers will not be considered under any circumstances.**

Thanking You,

Yours Faithfully

  
**CONSULTANT  
(PURCHASE & STORES)**

**IISER-TVM**  
**PUBLIC TENDER NO. IISER/PUR/PT/12/10**  
**SCHEDULE**

**1. TENDER NO. IISER/PUR/875/10**

**FEMTOSECOND (FS) LASER AMPLIFIER SYSTEM**

**1. Ti:SAPPHIRE AMPLIFIER SPECIFICATIONS:**

Specifications at peak wavelength (~ 800nm):  
Pulse duration (FWHM): 90- 130 fs  
Minimum pulse energy: 4 mj

**General characteristics:**

Minimum Tuning range: 770-840 nm  
(*The system should be tunable without change of optics*)  
Repetition rate: 1 KHz  
Polarization: Linear  
Spatial mode: TEM<sub>00</sub>  
Beam quality:  $M^2 < 1.35$   
Beam diameter (1/e<sup>2</sup>): 5- 8mm  
Minimum contrast ratio: (*Ratio of the peak intensity of the output pulse to any pre pulse that occur > 1ns before / after the pulse*)  
1000:1 pre-pulse  
100:1 post-pulse

**1. a) Diode pumped solid-state Q-switched laser for pumping the amplifier**

Wavelength: 527 nm  
Pulse energy: 20 mj  
Pulse repetition rate: 1 KHz  
Seed laser (Ti:Sapphire oscillator) should meet the specifications given below so that the oscillator can be used as a stand-alone laser if required.  
The pump and/or seed laser should not be integrated along with the amplifier into a single box.  
Any other accessories like chillers etc, necessary for functioning of the pump laser/amplifier should be provided.

**2. Ti:SAPPHIRE OSCILLATOR SPECIFICATIONS:**

Specifications at peak wavelength (~ 800nm):  
Pulse duration (FWHM): 90 - 130 fs (*It should be possible to upgrade the system at a later stage to picosecond mode using suitable optional hardware*)  
Average power: 1.3 - 1.5 mW

**General characteristics:**

Minimum Tuning range: 700-1000 nm (*The system should be tunable without change of optics; a tuning range of 700 – 1050nm is preferred*)  
Average power at the long wavelength end should not be less than 200 mW and at the short wavelength end should not be less than 400 mW.  
Repetition rate: 80 ± 5 MHz  
Beam diameter (1/e<sup>2</sup>): 0.6 - 2mm  
Maximum beam divergence (full angle): 1 - 2 mrad  
Spatial mode: TEM<sub>00</sub>

Polarization: Linear

There should be a facility to purge the laser with nitrogen.

**2. a) Diode-pumped solid-state laser for pumping Ti:Sapphire oscillator**

Wavelength: 532 nm

Average power: 10 W

Beam diameter: 2-2.5 mm

Beam divergence: 0.5 mrad

The pump laser and oscillator should not be integrated into a single box.

Any other accessories like chillers etc. necessary for functioning of the pump laser/oscillator and other items necessary for integrating the pump laser, oscillator and the amplifier should be provided.

**3. OPTICAL PARAMETRIC AMPLIFIER**

Spectral range: 240 – 2600 nm

Pump duration: 90-130 fs

Pump energy: upto 5 mj

Pump repetition rate: 1 KHz

Minimum Pulse energies when pumping with 1 mj pump: (Output energies should scale linearly with pump energy in the range 0.2 mJ – 4 mJ)

1150- 2600 nm: 200  $\mu$ J

475 – 1150 nm: 60  $\mu$ J

290 – 475 nm: 15  $\mu$ J

240- 290 nm: 5  $\mu$ J

**4. FLUORESCENCE UP-CONVERSION SPECTROMETER**

Spectral range: 400-1600 nm

Pulse repetition rate: 100 kHz – 100 MHz

Maximum delay between gate and excitation pulses: 2 -3.5 ns

Minimum step of the gate pulse: 0.6 - 7 fs

Temporal resolution: ~ 100 -250 fs

Optics and necessary accessories for fluorescence anisotropy measurements, rotating/translating sample assembly and necessary filters should be provided. Instrument should contain double monochromator with wavelength range of 200-1200 nm. Necessary accessories for generating second and third harmonic frequencies and beamsplitter optics should be provided. Computer controlled photon counting photomultiplier tube with necessary software. Other additional accessories for complete functioning of the instrument may also be quoted.

**5. FEMTOSECOND TRANSIENT ABSORPTION PUMP-PROBE SPECTROMETER**

Multichannel probe spectral range: 400-1600nm

Pulse repetition rate: 10 Hz – 1 KHz

Maximum delay between gate and excitation pulses: 1.5 – 3.5 ns

Minimum step of the gate pulse: 0.6 – 3.5 fs

Temporal resolution: ~ 100 -250 fs

Optics and necessary accessories for pump-probe measurements should be provided. Instrument should contain femtosecond white light generator for probe and reference pulse formation at 400-1600 nm. Necessary optics for sample excitation using OPA at 250-1600 nm. Rotating/translating sample cell and sample holder for solid samples and thin films. Necessary filters.

Multichannel detector(s) with image sensors having 300-1600 nm spectral response. Instrument should have computer controlled imaging spectrometer with necessary coupling possibility to the detector. Instrument should have necessary grating covering spectral range of the pump/probe/detector. Video camera for the delay stage adjustment. Computer with necessary software. Other additional accessories for complete functioning of the instrument may also be quoted. Necessary optics for coupling the system to OPA should be provided.

**6. OPTIONAL ACCESSORIES FOR THE LASER AMPLIFIER SYSTEM:**

- 1) Handheld IR viewer: 350-2000 nm range, battery operated, 2.5x lens and an IR filter
- 2) Power meter with matching detector, should be able to detector powers down to ~5 mW, capable of withstanding 20 W & 20 KW/cm<sup>2</sup> power, Range 250 -3000 nm, Battery (rechargeable preferred) operated.
- 3) Spectrum analyzer: 350 -1000nm range, Spectral resolution ~1.5 nm, USB interface and necessary software.

**SPECIAL CONDITIONS**

**1. COMPLIANCE STATEMENT**

Along with the technical details provide a tabular column indicating whether the equipment quoted by you meets the specifications by indicating 'YES' or 'NO'. If 'YES', support the claim by providing original brochures.

**2. REFERENCES:**

Names of Institutes with contact person and telephone/ email where similar equipment supplied by you in India [Preferably south] shall be mentioned in the bid.

**3. TWO - PART TENDER**

**PART I - TECHNICAL BID:**

Consisting of all Technical details alongwith commercial terms and conditions.

**PART II - PRICE BID:**

Showing item-wise prices for the items mentioned in the Technical Bid. The technical bid and the Price bid should be in separate sealed and superscribed covers. Both these covers are to be put in a sealed bigger cover superscribing Tender No and due date. Technical bids will be opened first and after evaluation, price bids of only the shortlisted bidders will be opened.

**4. RELOCATING THE EQUIPMENTS**

This equipment is to be initially installed at IISER Transit Campus [CET] and later, when permanent campus of IISER is ready at Vithura [40 Km from Trivandrum], the same is to be relocated there. Prices quoted for the equipment shall be either inclusive of relocating the equipment or a separate quote shall be shown in the Price Bid for the same [dismantling, transporting, installation and demonstration at the new location].

  
**CONSULTANT**  
**[PURCHASE & STORES]**

**IISER – TVM**  
**INSTRUCTIONS TO TENDERERS [INDIGENOUS].**

1. Tenders should be sent in sealed envelopes superscribing the relevant tender no. and the due date of opening. Only one tender should be sent in each envelope.
2. Late tender and Delayed Tenders will not be considered under any circumstances.
3. Sales Tax and /or other duties/levies where legally levies and intended to be claimed should be distinctly shown separately in the tender.
4. (a). Your quotation should be valid for a minimum period of 60 days from the date of opening of the Tender. Quotation with firm prices will be preferred.  
(b). Prices are required to be quoted according to the units indicated in the Invitation to Tender. When quotations are given in terms of units other than those specified in the tender form, relationship between the two sets of units must be furnished.
5. (a) Preference will be given to those tenders offering supplies from ready stocks and on the basis of delivery at IISER site.  
(b) Preference will also be given to those who agree our payment terms of within 30 days of receipt and acceptance of the item at our site.
6. (a) All available technical literature, catalogues and other data in support of the specifications and details of the items should be furnished along with the offer.  
(b) Samples, if called for, should be submitted free of all charges by the tenderer and the IISER shall not be responsible for any loss or damage thereof due to any reason whatsoever. In the event of non-acceptance of tender, the tenderer will have to take back the samples at his own expense.  
(c) Approximate net and gross weight of the items offered shall be indicated in your offer. If dimensional details are available the same should also be indicated in your offer.  
(d) **Specifications:** Stores offered should strictly conform to our specifications. Deviations, if any should be clearly indicated by the tenderer in their quotation. The tenderer should also indicate the Make/Type number of the stores offered and provide catalogues, technical literature and samples, wherever necessary along with the quotations. Test Certificates wherever necessary should be forwarded along with supplies. Whenever specifically mentioned by us the tenderer could suggest changes to specifications with appropriate reasons for the same.
7. IISER shall be under no obligation to accept the lowest or any tender and reserves the right of acceptance of the whole or any part of the tender or portion of the quantity offered and the tenderers shall supply the same at the rates quoted.
8. Corrections, if any, in the Quotation must be attested. All amounts shall be indicated both in words as well as in figures. Where there is difference between amounts quoted in words and figures, amount quoted in words shall prevail.
9. The tenderer should mention the name of his bankers, Sales Tax Registration, PAN number etc in the tender.
10. The authority of the person signing the tender, if called for, should be produced.
11. The purchaser reserve the right to accept or reject the lowest or any other offer in whole or in part without assigning any reason.
12. IISER being a Govt of India Educational and Research Institute, is exempted from payment of Excise Duty and Customs Duty under Notification No. 51/96- Customs dated 23<sup>rd</sup> July 2009. Also, we can issue Form 16 as per VAT Rules.
13. There is no EMD or Tender Cost.

  
**CONSULTANT**  
**(PURCHASE & STORES)**

**IISER-TVM**  
**INSTRUCTION TO TENDERERS [IMPORTS]:**

1. **PRICE:** The price quoted shall be firm. The terms of FOB/EXW/FCA/CIF/CIP etc shall be clearly mentioned.
2. **AGENT & AGENCY COMMISSION:** In case Tenderer is represented by any agent in India, their name and address shall be furnished. The amount of commission included in the price shall be clearly shown in the offer; which will be paid directly to the Indian Agents by purchaser in equivalent Indian Rupees. In case Indian agents existing and their agency commission is not shown in the Tender, reasons for the same shall be clearly mentioned in Tender. Details of Indian agent's statutory registration shall be stated. If Agency Commission is paid by Principals in foreign currency, the reasons for the same and exemption from Enforcement Directorate in India shall also be provided.
3. **LEAFLET/CATALOGUE:** Tenderer should furnish all necessary leaflet/catalogue etc., of the stores offered by him to enable the Purchaser to evaluate his offer correctly.
4. **MODE OF DESPATCH:** Tenderer shall indicate the mode of dispatch (*i.e.*, Sea/Air-freight/Parcel Post, etc.) depending upon the normal mode of dispatch adopted by him for the type of stores offered for consideration of the Purchaser.
5. **COUNTRY OF ORIGIN:** Tenderer shall indicate in his offer the country of origin of goods offered and the name and address of the manufacture.
6. **INSURANCE:** If insurance of the goods is felt necessary, the same shall be advised by the Tenderer in the offer.
7. **DELIVERY/SHIPMENT:** The time for and date of delivery quoted shall be reasonable/realistic and shall strictly be adhered to in case of placing order on the Tenderer.
8. **MODE AND TERMS OF PAYMENT:** Payment in full (excluding the amount of Agency Commission included in the price payable directly by the Purchaser to the Indian Agents in Indian Rupees) will be made immediately on presentation of the prescribed documents against SIGHT DRAFT or LETTER OF CREDIT.
9. **WARRANTY:** Period of warranty and conditions shall be clearly mentioned in the Tender.
10. **GENERAL:** The Tenderer shall also be complied with the following:
  - a. Mention your Banker's name and address.
  - b. Show approximate net and gross weight and dimensions of packages/cases.
  - c. Furnish list of recommended spares for satisfactory operation for a minimum period of one year if the quote is for Plant & Machinery, Equipments etc.
  - d. Details of any technical service, if required for erection assembly, commissioning and demonstration.
  - e. Conform that the prices quoted are inclusive of all taxes, levies, duties arising in the tenderer's country.
  - f. The offer is valid for a minimum period of 90 days from the due date of opening of the tender.
  - g. Samples, if called for, will be sent free of all charges.
  - h. Late tenders and Delayed will not be considered.
  - i. Offers made by Indian Agents on behalf of their Principals, should be supported by the Proforma Invoice of their Principals.
  - j. The authority of person signing the tender, if called for, shall be produced.
  - k. The purchaser reserves the right to accept or reject the lowest or any other offer in whole or in part without assigning any reason.

  
CONSULTANT  
(PURCHASE & STORES)