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

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IISER/PUR/PT/19/10 Date: 7th December 2010

INVITATION TO TENDER

Dear Sirs,

SUB: PHYSICAL PROPERTY MEASUREMENT 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 *31ST DECEMBER 2010 [3 PM].* 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/19/10
SCHEDULE

I. TENDER NO. IISER/PUR/972/10

PHYSICAL PROPERTY MEASUREMENT SYSTEM:

Computer controlled cryogen-free Physical Property Measurement System (PPMS) with working temperature range (1.9 K-400 K), top loading, high magnetic field (9 Tesla or more) where a broad range of measurements of AC-DC electrical transport, Vibrating Sample Magnetometer, heat capacity, thermal transport etc could be performed at variable magnetic fields, variable temperatures and other relevant parameters for different kind of samples in polycrystalline, single crystal and thin film forms. The specifications in detail are given below:

BASIC UNIT

A. MAGNET AND SAMPLE CHAMBER SPECIFICATIONS

1. Specifications of the Superconducting Magnet:

- Longitudinal configuration with minimum field of ±9 Tesla or higher.
- The magnet should have field uniformity of ±0.01% over Scm sample space or better.
- It should have a highly stable bi-polar power supply with over voltage protection.
- The magnet should have both Persistent and Driven modes with No Overshoot, linear and oscillating provisions with very good resolution of magnetic field.

2. Temperature Control specifications:

- Temperature range 1.9-400 K with an accuracy of ±1% or better in zero to full magnetic field.
- Very good Temperature control with no overshoot, fast settle and sweep modes with slew rate 0.01-6 K/min or better.
- Temperature stability of ±0.2% or better for T < 10 K and ±0.02% or better for T > 10 K for a typical sample size of 2.5 cm.

3. Cryogen free system:
The system should come with cryogen-free magnet and with air cooled variable speed compressor.

- Initial cool down should be possible using He-gas (without using liquid He) only.
- Cool down time (< 30 hrs).
- System continuous operation: 20,000 hrs or better.

B. MEASUREMENT PROBES

Quote prices for Item 1-7 individually.

1. Vibrating Sample Magnetometer (VSM):

A fast, sensitive and fully automated Vibrating Sample Magnetometer with

- Longitudinal configuration of magnetic field, sample vibration and moment detection all along the vertical axis.
- Sensitivity: better than 10^{-6} emu.
- Relative noise: (6×10^{-7} emu $/\sqrt{Hz}$ or less).

Continued.....2

- Accuracy: 0.5 % or better.
- Please specify the maximum measurable moment/peak amplitude.
- VSM oscillation frequency: 40 Hz or higher.
- Sample oscillation amplitude range: 0.1 to 5 mm or wider.
- Automated and fast sample centering option.
- Temperature range: 1.9 K to 400 K.
- Appropriate sample holders for measurements on different samples in powder, single crystal and thin film forms.

2. AC Susceptibility

- Temperature range: 1.9 K to 400 K or wider.
- AC frequency: 10 Hz -10 kHz or more.
- AC field amplitude range: few mOe to 15 Oe or more.
- Sensitivity range: 2x 10^{-8} emu or better.

3. DC Electrical Transport

- DC current range: 5nA to 5 mA or wider.
- Sensitivity: 20 nV or better.
- Appropriate sample holder (3 numbers).

4. AC Electrical Transport

Measurements should be possible for AC resistivity (4 wire), Hall effect (5-wire mode), critical current and I-V characteristics.

- Temperature range: 1.9 K -400 K.
- AC current range: 10 IJA to 500 mA or wider.
- Frequency range: 1 Hz to 1 kHz or wider.
- Critical current up to 2 Amp.
- Appropriate sample holder (3 numbers).

5. Heat Capacity:

- Specific heat, preferably in the relaxation mode for measuring small samples.
- Working temperature range: 1.9 K -400 K.
- Please indicate the sample size dimensions required for this measurement.
- Resolution of measurement needs to be at least 10 nJ/K at 2K or better.
- Microcalorimeter and other accessories required to achieve accurate measurements need to be supplied with the system.
- Appropriate sample holder (3 numbers).

6. Ultra low field capacity attachments

- Should be compatible with both VSM and AC susceptibility options.
- Residual field < 0.1 Oe.
- Residual field uniformity: ± 0.1 Oe or better.

7. High temperature attachment for VSM

- Temperature range: 300 K to 1000 K or higher.
- RMS sensitivity: < 10-5 emu or 0.5% or better.
- Noise floor: less than 10-5 emu rms (H=O).
- Accuracy: "'lxl0-5 emu/tesla or better.
- Temperature precision: 0.5K or better.
- Temperature accuracy: 2% or better.
- Appropriate sample holder for high-T measurements (more sample holders).
- Mention in detail the arrangement to heat the sample.
- Any other accessories required for this purpose.

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OPTIONAL ITEMS

1) **He-3 insert**: He-3 inset for carrying out measurements down to 400 mK (or 0.4 K). Sample holders for all possible measurement options in He-3.

2) Thermal transport

- ⇨ Temperature range: 1.9 K -390 K.
- ⇨ Thermal conductance measurement accuracy: ±5 % or better for T<200 K.
- ⇨ Accuracy of Seebeck coefficient: ±5 % or better.
- ⇨ Amplitude range: lIJV/K to 1 V/K or wider.
- ⇨ Should be compatible with AC electrical transport option mentioned above.
- ⇨ Appropriate sample holders.

3) Electrical Transport for high resistance measurements

Measurements should be possible for AC resistivity (4 wire) and I-V characteristics.

- ⇨ AC Current Range: 10nA to 100 mA or wider.
- ⇨ Frequency range: 0.1 Hz to 200 Hz or wider.
- ⇨ Accuracy: 0.2% or less (for R<200 kΩ).
- ⇨ Very low to 10 MOhm in 4-wire mode and 1 MOhm to 5 GOhm in 2-wire mode.
- ⇨ Appropriate sample holders.

4) Torque Magnetometry

- ⇨ RMS Torque noise level: 1 x 10-9 Nm.
- ⇨ RMS Moment sensitivity: less than 1 x 10-7 emu at 9 T with 40 sec sampling time.
- ⇨ Maximum Torque: 1 x 10-5 Nm.
- ⇨ Sample size: 1.5 x 1.5 x 0.5 mm and < 10 mg.
- ⇨ Indicate the sample dimensions, sample weight sampling time.
- ⇨ Appropriate sample holders.

5) Horizontal sample rotators

For performing angular dependent magnetic properties of small anisotropic singlecrystals or thin-films the system should have option for sample rotation in horizontal planes. A thermometer, in direct contact with the sample mount should enable accurate determination of the sample temperature. Both rotators should incorporate standard motors.

Specifications:

- ⇨ Should be compatible with the Torque magnetometry.
- ⇨ Angle of rotation should be in the range from: -10° to 370° with a well defined angular step size ofabout 0.010 or small.
- ⇨ Should be usable in the entire temperature range of 1.9 K to 400 K at least and above if possible with oven attachment.
- ⇨ Specify the highest temperature up to which the rotator assembly can be used.

6) UPS with battery back-up system for at least two hours.

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TECHNICAL SUPPORT

- Warranty is required for at least 3 years.
- Spares for trouble-free operation for at least 7 years.
- User friendly and multi-licensed window based operating software for automatic data collection and data analysis.
- Provide a computer with latest configuration for interfacing.
- A heavy duty color Laser Printer should be provided along with it.
- All vacuum pumps for pumping sample space should be provided.

TERMS AND CONDITIONS

- The manufacturer has to stand guarantee for the relocation of the PPMS once the permanent campus of IISER Trivandrum gets ready at Vithura. They must be in a position to dismantle the setup in the present campus and re-install it at the new campus.
- Onsite training of all PPMS options to the users.
- Enclose details about space, electrical power and other utilities required for the installation of the system.
- Specify number of factory trained engineers based in India.
- The vendors are requested to mention all the technical details of their model and also to supply a list of recent installations of the quoted model in India.

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.

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 quote d 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 23rd July 2009. Also, we can issue Form16 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. Incase 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 ORGIN:** 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 incase 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.

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