



तेजपुर विश्वविद्यालय / TEZPUR UNIVERSITY

(केंद्रीय विश्वविद्यालय / A Central University)

- कुलाध्यक्ष का सर्वोत्तम विश्वविद्यालय पुरस्कार, 2016 और एनआईआरएफ भारत रैंकिंग 2016: नं. 05
- Visitor's Best University Award, 2016 and NIRF India Ranking 2016: No. 05

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SHORT QUOTATION NOTICE

TU/11-24/Pur/Qtn/2016-17/802-A. dated:-06.06.2016

Sealed quotations are invited from reputed manufacturers/authorized dealers/vendors for supply, installation & commissioning etc. of **500 MHz NMR Instrument** required for the Central Facility of Tezpur University. Those who have participated against our earlier notice no. TU/11-24/Pur/Qtn/2015/4036 dated 14.01.2016 may submit their fresh offer/quotation without payment of EMD/Tender Fee.

Minimum Technical Specification of 500 MHz FT NMR Spectrophotometer:

A dedicated SB (~50 mm) 500 MHz NMR spectrometer with three channels to carry out both solution-state and solid-state NMR experiments.

- 500 MHz NMR spectrometer for solids and liquids
 - Superconducting magnet system with operation field at 11.4 Tesla with active shielding and bore size of ~50 mm (standard-bore magnet) for high-performance and should be with latest magnet technology
 - Field stability 5 Hz/hour or better
 - Active shielding with Radial stray field at 0.6 m from magnetic center: 0.5 mT or less and axial stray field at 1.2 m from center of magnetic field
i.e. Stray magnetic should be within the legs of magnet and 0.5 m from the top of the magnet.
 - Standard magnet stand, vibration damping accessory, helium and nitrogen level meters
 - Liq He hold time should be ≥ 150 days and Liq Nitrogen hold time should be ≥ 15 days.
 - Liq He and Liq N₂ sensors with alarm facility and
 - Helium and Nitrogen refilling accessories along with accessories for cryostat functioning.
 - Vibration proof i.e. anti-vibration legs with vibration damping for >3 Hz
 - Shim system for optimal line shape should be minimum of 32 shim systems.
- Radiofrequency aspects
 - Digital quadrature detection for elimination of quadrature images
 - Digital lock frequency, digital quadrature lock receiver, fast field adjustment
 - Digital receiver control unit for signal acquisition with real-time digital filtering along with oversampling technology.
 - Highest possible precision pulse generating system, pulse decoupling generator for synchronous and asynchronous operation
 - Buffer memory for flexible real-time data management
 - State-of-the-art receiver with digital quadrature detection, high dynamic range and bandwidth, high oversampling rates, signal decimation and digital filtering.
 - Frequency, phase, and amplitude shaping capability with simultaneous switching of the parameters possible in < 50 ns
 - Broad-banded frequency generation for three channels
 - Communication between all channels by fast Ethernet based communication system
- Amplifiers
 - High-power linear broadband amplifiers of 1000W for ¹H channel, 500W for X-channel and 100W amplifier for the deuterium channel. It should be with appropriate preamplifiers with filters for experiments with various broadband nuclei.
 - Low noise for NMR signal preamplifiers for ¹H, ²H, ¹⁹F and X nuclei
 - The system should be with routing capabilities for frequency/ amplifier selection under full computer control with 2H amplifier, lock switch and gradient shims.



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-
- Built-in tuning and matching display with automatic tuning and matching capabilities.
 - Variable temperature set up from -200 °C to 200 °C with a resolution of 0.1 °C and with gas flow and pressure monitoring (please specify temperature accuracy and stability)
 - Capabilities for Gradient spectroscopy
 - Gradient strength of ≥ 50 G/cm
 - Z-gradient unit with adjustable gradient amplitude and provision of rapid automated gradient shimming.
 - Software and workstation
 - Suitable latest high performance server for data acquisition and processing (Please specify RAM, HDD, DVD RW, latest technology monitor, latest Windows based OS etc.)
 - Linux based software for NMR acquisition and processing (arbitrary dimensions). Software should have high level of automation to setup and execution of a complete range of NMR experiments
 - One additional PC for data storage and subsequent analysis must be quoted
 - Suitable Laser Jet Printer with high DPI
 - Multiuser NMR data processing software for students to work up on raw NMR data
 - Free updates for a period of 10 years and five extra licenses.
 - Probes: Solution state
 - 5 mm triple resonance pulsed field gradient probe (broad band inverse probe) with provision for single and simultaneous irradiation of both X and Y nuclei with variable temperature operation from -150 °C to +150 °C and facility for deuterium observation and decoupling
 - 5mm triple resonance ($^1\text{H}/^{13}\text{C}/^{15}\text{N}$) probe with pulsed field gradient probe with provision for single and simultaneous irradiation of both ^{15}N and ^{13}C with salt tolerance and variable temperature operation from -150 °C to +150 °C and facility for deuterium observation and decoupling.

To be quoted separately:

- ❖ Additional Probe: A probe for detecting low gamma nuclei such as Tungsten, Vanadium and silver
- ❖ Additional Probe: Multinuclear broadband observe probehead with Z-shield gradient, capable of performing ^{19}F NMR using the same probehead. Broadband observe with Fluorine that is capable of decoupling both $^1\text{H}/^{19}\text{F}$
- Probes: Solid state
 - 3.2 mm H/X/Y probe (with inserts and filters for broad-band operation), variable temperature range -140 °C to 200 °C, maximum nutation frequencies of 200 kHz, 150 kHz, and 100 kHz on ^1H , X, and Y channels respectively
 - 20 Zirconia rotors, 40 KEL-F caps and 20 Boron Nitride caps with other rotor accessories such as cap removal assembly
- Fully automated pneumatic unit for magic-angle spinning experiments that includes spinning rate stabilisation of ± 1 Hz, sample ejection and insertion conveniently, facility for rotor synchronized experiments, provision for both automatic and manual local operation, precise control of the rotor angle for STMAS kind of experiments



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- Liquid helium (LHe) and liquid nitrogen (LN₂) needed for installation and for quench if occurred during installation and afterwards must be supplied by the vendor. LHe refilling needed for continuous stability of cryomagnet and the system is the responsibility of the vendor for at least 5 years
- Spectroscopy kit: Sample tubes: 5 mm - 500 pcs; Caps, 5 mm: 600 pcs; Spinner standard, 5 mm: 3 pieces; 3 mm spinner and 50 tubes for 3 mm; Sample Solvent height measuring device; Sufficient standard samples for shimming, pulse width measurements, line shape measurement, S/N measurement, etc.
- All expenses paid training for one person at the company on software and operation of the spectrometers with some emphasis on the basic/advance technical aspects. Supplier should arrange for the application/maintenance training free of cost by their application expert after the installation of the system at the site of installation
- Warranty of 5 years from the date of complete and satisfactory installation of the spectrometer

Other Accessories Local purchase

1. **Oil free Air compressor**, Anest Iwata Scroll Compressor Model SLP-22E ` having 250 Liter/min air delivery, 10 bar maximum pressure. Refrigerant and desiccant dryer and air filters for oil and moisture free air. 300 liters air storage tank.
2. Suitable True sine wave Online UPS for uninterrupted power supply to the system with 2 hour backup and with spike buster and tripping bypass
3. Sufficient number of spares for routine maintenance
Complete set of Instruction Manuals
Liquid nitrogen transfer lines (1 no.).
Liquid nitrogen transfer tubes: 2 sets
4. Self-pressurized Liq N₂ storage tank for 125-250 lit.

After sale service: Supplier should mention their details of service setup and manpower at nearest location, who are responsible for after sale support. Response time should be within 48 hrs. Supplier is expected to provide probe backup in case of probe breakdown at customer's site so that users are not affected.

Bid should include both FCA/FOB and CIP Kolkata prices. Transportation cost with insurance from port to Tezpur University (ASSAM) should also be clearly mentioned

Optional Items (please quote separately):

- Automatic sample changer
- Low temperature accessory: Low temperature accessory with 26 liter LN₂ dewar, evaporator and transfer line for operation with LN₂ low temperature
- Option for cryo-probe (1H-broadband with z-gradient and 2H lock) with higher sensitivity
- Spares and accessories should be available for at least 15 years from the date of installation
- Comprehensive maintenance warranty which shall include magnet, probes, UPS and all accessories for 5 years after the expiry of warranty period for another 5 years and should be quoted
- Original brochure should be provided with quotations
- Important spares (if any) for trouble free operation shall be quoted separately

GENERAL TERMS & CONDITIONS:

1. No separate tender paper will be issued from the office; one should only download the specifications/List from the website.
2. **The rates should be preferably quoted in Indian Rupee and FOR Tezpur University, Napaam basis. Charges for clearing and transportation should be incurred by the supplier.**
3. *Quotations should be accompanied by i) An EMD (in the form of Demand Draft/Call Deposit/TDR) of ₹. 5000/- (Rupees Five Thousand) only drawn/pledged in favor of Registrar, Tezpur University, payable at Tezpur. No request for consideration of earlier deposited EMD will be considered. ii) A*



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non refundable application (quotation) fee of ₹.5000.00 (Rupees Five Thousand) only have to be paid only by Demand Draft drawn in favour of Registrar, Tezpur University payable at Tezpur.

4. The rates should be exclusive of taxes and applicable tax % should be clearly indicated.
5. Quoted rates should be valid at least for a period of 01 year.
6. The rates should be quoted along with supporting documents of specifications and technical features and list of users.
7. The system must be installed at the laboratory, and after installation a basic training must also be provided by the supplier or their Indian counterpart without any additional costs.
8. An additional site requirement materials, accessories etc. has to clearly mentioned.
9. All the quotations must be accompanied with supporting documents and / or literature.
10. Demonstration may be sought from the vendors for authentication of quoted specification.
11. Details of availability of after sales support will have to be furnished. After sales support directly from manufacturer and from Assam (Guwahati / Tezpur) will be preferred.
12. The University is exempted from paying Custom and Excise duty.
13. Proprietary items should be quoted with sole Manufacturer/Distributorship certificate.
14. Warranty/Gurantee period should be specifically mentioned in the quotation.
15. No Advance payment will be made. However, for foreign supplier, advance payment will be made either by FDD/Wire Transfer/LC. In such cases 10% Performance Bank Guarantee should be submitted before issuing FDD/Wire Transfer/LC, covering the warranty period.
16. Performance Bank Guarantee also has to be submitted for Major equipments of Indian origin, covering the warranty period.
17. Items of Foreign origin should have Insurance up to installation on site.
18. The University reserves the right to accept or reject any or all the quotations without assigning any reason.
19. Quoted price should be inclusive of essential accessories and should be CIF Tezpur University, Tezpur
20. Applications for release of EMD should be submitted to the Registrar/ Deputy Registrar.
21. If possible, complete correspondence of the quotationer be mentioned in the reverse side of the EMD preferably by pencil to enable us to refund the EMD.
22. Apart from the above terms and conditions the University has the right to include any other terms and conditions as and when felt necessary.
23. **Quotation should be submitted in the DROP BOX placed in the reception of the Administrative Building of the University within 30 days from the issue of the notice. If posted/couriered, should reached within 30 days from the issue of this notice addressed to "The Deputy Registrar (GA), Tezpur University". The Quotation Notice No. and date should be clearly superscribed in the the envelope/packet containing the quotation.**

Sd/-Deputy Registrar (GA)
Tezpur University