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AMENDMENT TO BIDDING DOCUMENT No. 2009-10/04

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				iµ ibD p/`all Two Bid System			
1	Pur-125F/EP/EMU/2009	Atomic Force Microscope	**26.9.2009 to 03.11.2009**	**12.10.2009 03:00 pm**	**03.11.2009 upto 05.00 PM**	**04.11.2009 at 03.00 PM (Technical Bid)**	Rs. 90,000/-

inivda p5 vehsa[3 se www.neeri.res.in in:xuk Da]nloD ikya ja skta hE yid poS3 µara inivda0. caih0 to indexk, nIrI, nagpur ke nam ÕÒÒã- = ka iDmaD DaF3 wesje Tender Document can be downloaded **free of cost** from website www.neeri.res.in . If the Tender Document is required by post , a Demand Draft of Rs. 300/- only drawn in favour of Director NEERI, Nagpur is to be sent.

WaDar 0v. ¢y Ai2karl
Stores & Purchase Officer

CHAPTER 04: SPECIFICATIONS AND ALLIED TECHNICAL DETAILS

Measuring modes: In air:

- Contact AFM
- Lateral Force Mode (LFM)
- Semicontact/Tapping Mode and noncontact AFM
- Phase Imaging with amplitude modulation
- Force Modulation
- Adhesion Force Imaging
- Magnetic Force Mode and Electrostatic Force Mode (MFM / EFM)
- AFM and STM spectroscopies
- Spreading Resistance Imaging (SRI)/ Conducting AFM
- Scanning Tunneling Microscopy (STM) (Approx. Current range 30pA to 50 nA)

Scanning types:

- Scanners must be piezo construction for highest resolution with facility for both solid and liquid samples
- The system should have facility for either Scanning-by-sample OR Scanning-by-probe

Scanners

Small Scanner

- Scanning range: Up to 10x10x2 um
- Non-linearity XY: 0.4% (fast direction), 0.8% (slow direction)
- Z noise RMS in 1000Hz bandwidth: <0.03nm
- Max sample size: up to 40mm in diameter, 15mm thick

Scanner with low noise capacitance sensors

- Scanning range : 100×100×12 um
- Non-linearity XY :0.1% peak to peak/2
- Non-linearity Z :1%
- XY RMS noise in 200 Hz bandwidth (with capacitance sensors): 0.1 nm
- XY RMS noise in 200 Hz bandwidth (without capacitance sensors): 0.01 nm
- Z capacitance sensor RMS noise in 1000 Hz bandwidth: 0.03 nm
- Z RMS noise in 1000 Hz bandwidth (with capacitance sensors): 0.05 nm
- Z RMS noise in 1000 Hz bandwidth (without capacitance sensors): 0.04 nm
- Drive resolution : 0.006 nm

XY sample positioning:

- Range of sample positioning: 5x5 mm
- Positioning accuracy: 2um

Tip Viewing

- AFM scanning cantilever/probe optical surface should be viewable on axis in real time via Direct Optical Video Access by CCD.
- There should be a zoom function with zoom range from 2X to 13x.
- The resolution of the device should be better than 2 microns.
- Horizontal field of view 1.2 to 0.4 mm or better

Vibration and acoustic isolation/ electric shielding:

An vibration isolation table / enclosure and acoustic enclosure which can also house the CCD / Video Access.

Accessories:

A set of soft and hard cantilevers containing minimum 100 nos. tips having different types like contact, non contact , MFM, EFM etc. A set of calibration standards like gratings etc. to be included.

Optional Items:

- Scanning Capacitance Imaging (SCI)
- Scanning Kelvin Probe Microscopy (SKM)
- Piezo Response Force Microscopy (PFM)
- Liquid cell for liquid imaging
- Electrochemical AFM/STM
- Temperature controller with temperature range between 4 to 180 deg C
- Humidity and environmental control chambers

Computer / controller and software

1. Latest computer system consist of latest Pentium processor, 4 GB DDR RAM 250 or more

GB HDD, 19 inch, LCD dual colour monitors x 2 for simultaneous data acquisition/image display and management/control, CD-RW drive, mouse, keyboard etc.

2. Controller should have the following minimum basic specifications
   a. Data transfer should be via USB link.
   b. Two Numbers of floating point Digital Signal Processors (DSPs) should be provided for scan and data.
   c. Special Lock-in amplifier with adequate frequency range, with true phase and
   d. amplitude imaging possibilities
   e. Five 16 bit DACs for X, Y, Z positioning.
   f. Five 16 bit data acquisition channels
   g. The controller should be latest - that allows free choice of data points up to 2000 X 2000 or higher for both high resolution imaging and zoom-in as well as for high resolution force spectroscopy.
   h. Should provide for customs scripting, customs spectroscopy, scripting capabilities, scripting examples and also scripting functions, so that one can easily design their experimental set up.
3. Software - Microsoft Windows operating system, supporting TCP/IP for networking. All standard options including user level scripting (C++) and image processing software.
4. Should have facility for self diagnostics

Upgradeability:

- Provision for upgradation for low current STM (10pA-5nA)
- Provision for upgradation with coupling of RAMAN and other spectroscopic techniques