

**KANNUR UNIVERSITY  
(PMU - D SECTION)**

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**CORRIGENDUM**

**Tender ID : 2025\_KnrU\_763269\_1**

**Tender Reference Number : PMU-D/DII/8876/2025**

All prospective Bidders are hereby informed that the Kannur University has modified the specification of the equipment titled ' **Table-top AFM system for ambient operation with active vibration isolation stage and advanced imaging options** ' in the aforementioned e-tender.

**Modified Specifications**

<b>Name of the Equipment</b>	<b>Table-top AFM system for ambient operation with active vibration isolation stage and advanced imaging options</b>
<b>AFM system</b>	<p>The AFM system should have the capability of imaging both biological as well as material samples.</p> <p>The AFM must have a XYZ tip or sample scanning configuration.</p> <p>The AFM system should include necessary and sufficient optics for proper sample observation and adjustments.</p> <p>The AFM system must be capable of scanning small, medium and large size samples without any modification to the scanner.</p> <p>The AFM system should have an active vibration isolation table and an acoustic enclosure for noise cancellation.</p> <p>The AFM should have an upgradation capability with an external or inbuilt inverted optical microscope.</p>
<b>Mode of Operation</b>	<p>Following scanning modes must be included in the offer:</p> <ul style="list-style-type: none"> <li>• Contact Mode</li> <li>• Tapping Mode</li> <li>• Lateral Force Microscopy</li> <li>• Phase Imaging</li> <li>• Force Modulation Microscopy</li> <li>• Lithography</li> <li>• Force Distance (F-D) Spectroscopy</li> <li>• Conductive AFM</li> <li>• Kelvin probe microscopy</li> </ul>
<b>Scanner</b>	<ul style="list-style-type: none"> <li>• Flexure-based XY scanner and decoupled piezo-based Z-scanner.; Piezo tube scanners are not acceptable; Open and Closed loop Z-control of the AFM scanner is a must.</li> <li>• The quoted scanner must have a XY axes scanning range <math>\geq 100 \mu\text{m}</math>, and Z axes scanning range <math>\geq 10 \mu\text{m}</math></li> <li>• The XY scanner must have drive resolution of 0.05 nm or better.</li> </ul>

	<ul style="list-style-type: none"> <li>• The Z scanner must have scan drive resolution of 0.005 nm or better.</li> <li>• Z-measurement noise level <math>\leq 0.035</math> nm (RMS, dynamic mode in air)</li> <li>• Must have possibility to have an ample choice of detachable cantilever holders with kinematic mount to accommodate standard commercially available cantilevers with or without alignment grooves.</li> </ul>
<b>Sample Stage</b>	Manual/motorized XYZ sample positioning with range of 20 mm x 20 mm or better.
<b>Sample Size</b>	The AFM system should be able to accommodate sample sizes up to 100 mm in diameter and 15mm or higher in thickness.
<b>System Optics</b>	<ul style="list-style-type: none"> <li>• The optics associated with the AFM system should have sufficient resolution (<math>&lt; 1.5 \mu\text{m}</math> or better) with a 5-megapixel or better.</li> <li>• The scanning cantilever/probe of the AFM and the surface should be viewable in real time via direct optical video access by CCD/CMOS and should include software to display and store the optical image from within the AFM-software.</li> <li>• The optics must have software-controlled white LED illumination.</li> </ul>
<b>System Controller and software requirements</b>	<ul style="list-style-type: none"> <li>• The AFM controller should have the capability for all digital signal processing for maximum freedom of operations</li> <li>• Very sensitive 24 Bit ADC/DAC for Zoom-In and precise acquisition</li> <li>• <b>16 bit controllers are strictly not acceptable</b></li> <li>• Highest quality of analog signal handling for minimum electronic noise</li> <li>• X/Y/Z-Axis Scan &amp; Position Controller 3 x 24Bit DAC, 200kHz or better</li> <li>• X/Y/Z-Axis Position Measurement 3 x 24Bit ADC, 200kHz or better</li> <li>• Excitation &amp; Modulation Outputs 4 x 16Bit DAC, 20MHz</li> <li>• Analog signal input bandwidth DC to 5MHz</li> <li>• Main Input Signal capturing 2 x 16Bit ADC, 20MHz, 2 x 24Bit ADC, 200kHz</li> <li>• Additional User Signal Outputs 3 x 24Bit DAC, 200kHz</li> <li>• Additional User Signal Inputs 3 x 24Bit ADC, 200kHz</li> <li>• Additional Monitor Signal Outputs 2 x 24Bit ADC, 200kHz</li> <li>• Digital Synchronization 2 x Digital Out, 2 x Digital In, 2 x I2C Bus</li> <li>• FPGA Module &amp; Embedded Processor ALTERA FPGA, 32Bit NIOS-CPU, 80MHz</li> <li>• 256MB RAM, Multitasking OS</li> <li>• Communication: USB 2.0 Hi-Speed to PC</li> <li>• System synchronization 10MHz internal quarts or external clock</li> <li>• Power 90-240 V AC, 70W, 50/60H</li> <li>• The data acquisition system must be capable of recording individual image sizes of Minimum 4000 to 8000 pixels or greater. All the above 16 channels should acquire higher pixels.</li> <li>• The software automatically recognizes the hardware and configures with the software appropriately.</li> <li>• Minimum 2 inbuilt Lock-in amplifier must be included in AFM configuration.</li> </ul>
<b>Detector</b>	<ul style="list-style-type: none"> <li>• High-speed, low-noise 4-quadrant photodiode detector.</li> <li>• Preferable to have a low coherence red laser for avoiding interference from sample surface reflection.</li> <li>• The laser on/off should be controlled through software.</li> </ul>

<b>Image Analysis software</b>	<ul style="list-style-type: none"> <li>• Image Display: dual imaging window for scan and retrace images.</li> <li>• Sample Navigator: assistant for localized zooming with respect to a large area scan.</li> <li>• Analysis Functions: line (single line profile) extraction, localized zooming, roughness display, measure length &amp; angles on the on the images, 2D FFT etc.</li> <li>• Image Processing Tool: spatial and Fourier low-pass filtering, background subtraction, zooming, contrast, slope correction etc.</li> </ul>
<b>Computer</b>	<ul style="list-style-type: none"> <li>• Latest branded PC with windows 10 operating system, 1TB hard disk (or better), 8 GB ram (or better), dual 23 inch monitor and licensed software for the operation of the instrument.</li> <li>• Software must be a single package for all modes and attachments with no need for additional software programs.</li> <li>• Software package must include both image acquisition and data processing software in one package with no need for different programs or operation.</li> </ul>
<b>Power Supply</b>	The system should be compatible with the Indian power supply e.g., 90–240 V AC, 70 W, 50/60Hz
<b>Installation and Training</b>	<ul style="list-style-type: none"> <li>• The system must be installed and demonstrated by the engineers of the manufacturing company at Department of Physics, Payyanur, Kannur University free of charge.</li> <li>• Comprehensive on-site training on all modes purchased is required to our satisfaction.</li> <li>• XYZ calibration should be demonstrated and calibration samples must be provided.</li> <li>• Hard copy of all manuals should be provided.</li> </ul>
<b>Warranty and Support</b>	<ul style="list-style-type: none"> <li>• Three year comprehensive warranty must be included along with the bid/offer on all parts and labour (mention the warranty policies clearly).</li> <li>• Warranty period should start after the completion of the installation.</li> </ul>
<b>Delivery Time</b>	Within 3-4 months after the receipt of the purchase order.

**All other terms and conditions for submitting the tender, as mentioned in the tender notice, remain the same.**

Sd /-  
Prof. (Dr.) Joby K Jose  
Registrar