INDIAN ASSOCITION FOR THE CULTIVATION OF SCIENCE

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PRE-BID CONFERENCE (June 12, 2021) FOR SCANNING PROBE MICROSCOPE

CHANGES IN TECHNICAL SPECIFIATION

CORRIGENDUM - I

Existing Specification			**Change / Insertion**
Sl. No.	Name	Specification	
1	Instrument Resolution	The instrument must have demonstrated atomic lattice resolution in AC mode and contact mode imaging. This must be done with the same large scan-range scanner that can also image at least 120 µm x 120 µm (XY) & 15 µm (Z) in closed loop. This allows large survey scans with the ability to zoom-in to get high resolution images at a region of interest.	The instrument must have demonstrated atomic lattice resolution in AC mode and contact mode imaging. This must be done with the same large scan-range scanner that can also image at least 100 µm x 100 µm (XY) & 15 µm (Z) in closed loop. This allows large survey scans with the ability to zoom-in to get high resolution images at a region of interest.
2	Instrument Geometry	Each axis of motion is independently actuated using its own piezo stack and flexure stage. Should have Integrated LVDT position sensors in all three axes provide seamless closed loop operation.	Each axis of motion is independently actuated using its own piezo stack and flexure stage. Should have Integrated LVDT / equivalent position sensors in all three axes provide seamless closed loop operation.
3	Operating Modes	• Resonance tracking mode - Operating on resonance to improve the measurement signal to noise for operating modes like piezo response force microscopy and contact resonance imaging.	Resonance tracking mode or such other equivalent technology supported with literature will be accepted - Operating on resonance to improve the measurement signal to noise for operating modes like piezo response force microscopy and contact resonance imaging.
		• The AFM system must be able to image samples and perform measurements in air and in liquid and even for commonly used electrical modes in air like EFM, PFM & KPFM etc using the same cantilever holder. The cantilever holder must be compatible	The AFM system must be able to image samples and perform measurements in air and in liquid and even for commonly used electrical modes in air like EFM, PFM & KPFM etc using the same cantilever holder. The cantilever holder must be compatible with most commercial cantilevers. Further for our specific applications a

		with most commercial cantilevers.	suitable fluid cell should be included for doing DNA AFM. The cell should be with Electrical Contacts. It should also have a provision for gas purge. For the requirement of probes the following should the minimal quantity of probes which should be included: • 10 AC Mode / Non Contact Mode / Force Spectroscopy Imaging in Air Probes with resonance frequency ~ 300 kHz, spring constant ~ 26 N/m • 10 AC Mode / Non Contact Mode / Force Spectroscopy Imaging in Air Probes with resonance frequency ~ 70 kHz, spring constant ~ 2 N/m • 10 Contact Mode two triangular gold coated nitride cantilevers for life science applications. resonance frequency ~ 17 & 67 kHz, spring constant ~ 0.08 & 0.32 N/m • 20 Nos – Probes for imaging in fluids with resonance around 110 kHz in air and 25 kHz in water with spring constant of around 0.1 N/m. Tip radius < 10 nm • 10 Nos – Electrical characterization probes • 20 STM probes All probes with type and quantity should be listed clearly in the offer and should also be offered as optional for us to choose additional quantity required.
		• Any other modes, which occur default modes with the quoted system should also be clearly mentioned.	Any other modes, which occur default modes with the quoted system should also be clearly mentioned. Feedback loop implemented to maintain maximum tip-sample interaction force with force control down to 10 pN.
5	System Scanner	• System should include a closed-loop XY scanner with a range of 120 µm.	To respond to requests from other vendors following change can be made: System should include a closed-loop XY scanner with a range of 100 µm.
7	Controller, Electronics & Software Minimal requirements	System must use at least 24-bit digital-to-analog converters (DACs) in order to generate the XY and Z piezo scan signals. At both 120-micron	To respond to requests from other vendors following change can be made: System must use at least 24-bit digital-to-analog converters (DACs) in order

		and 10-nm scan sizes, the corresponding bit resolution must be sub-Angstrom (<0.1nm). Note that this specification applies to the generation of the scanner drive signals, not the sampling of the scanner position sensors.	to generate the XY and Z piezo scan signals. At both 100-micron and 10-nm scan sizes, the corresponding bit resolution must be sub-Angstrom (<0.1nm). Note that this specification applies to the generation of the scanner drive signals, not the sampling of the scanner position sensors.
9	Optional	2. Conductive AFM - The system allows conductive measurements while scanning as well as at user specified locations (I-V curves). A sample bias of -10V to 10V is possible. The software allows user-specified wave forms for I/V spectroscopy (square, sine, triangle, pulse, or user defined). The current sensing range with output channels provide gains of 1e6 (1uA/V) & 1e9 (1nA/V), (4pA to 10uA). The bandwidth of the transimpedance amplifier must be at least 17kHz	2. Conductive AFM - The system allows conductive measurements while scanning as well as at user specified locations (I-V curves). A sample bias of -10V to 10V is possible. The software allows user-specified wave forms for I/V spectroscopy (square, sine, triangle, pulse, or user defined). The current sensing range with output channels provide gains of 3pA to 25nA (wider range will be preferred). The bandwidth of the transimpedanceamplifier must be at least 17kHz