

attoSNOM III

fiber based, low temperature scanning near-field optical microscope, tuning fork sensor

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Microscope Setup	
SNOM sensor unit	non-optical, non-contact tuning fork sensor with mounted glass fiber tip
tip-sample distance control	tuning fork shear force detection (non-contact mode)
Operation Modes	
feedback	PI feedback loop with additional PLL
topography	shear force mode (non contact)
light detection	transmission, collection through fiber
optional	low temperature compatible detector below the sample for transmission measurement (intensity)
Sample Positioning	
positioners and scanners	coarse positioners ANPxyz101 with piezo scanner ANSxyz100
coarse range	5 x 5 x 5 mm ³
step size	0.05 .. 3 μm @ 300 K, 10 .. 500 nm @ 4 K
fine scan range	40 x 40 μm ² @ 300 K, 30 x 30 μm ² @ 4 K
sample monitoring	sample / tip monitoring via CCD camera
Operating Conditions	
temperature range	1 .. 300 K (dependent on cryostat)
magnetic field range	0 .. 15 T+ (dependent on magnet)
operating pressure range	1E-6 mbar .. 1 bar (designed for exchange gas atmosphere)
Cooling Specifications	
bore size	designed for a 2" (50.8 mm) cryostat/magnet bore
cryostat	LTSYS -He4, LTSYS -He3
Probes	
probe design	designed for fiber based SNOM probes e.g. attocube's sub-wavelength aperture probes
Noise	
shearforce detection noise density	< 1 pN/√Hz
measured z-noise density	< 0.5 nm/√Hz
z bit resolution full range mode	7.6 pm
z bit resolution small range mode	0.12 pm
Scan Controller and Software	
ASC500 SPM controller	for detailed specifications please see the ASC500 section

