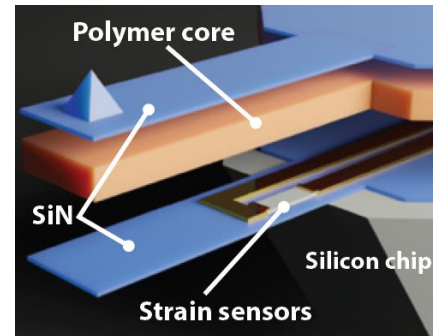


Trilayer Cantilever (TLC) probes

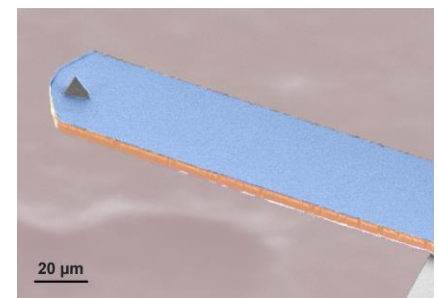
Silicon Nitride-Polymer AFM probes: for topography imaging

General description

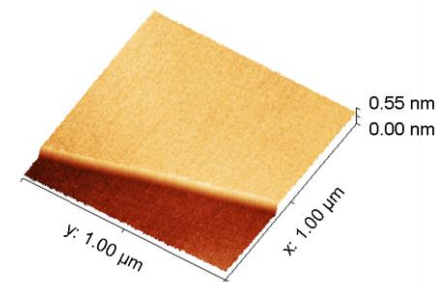
The Trilayer Cantilevers (TLC) feature a unique structure with Silicon Nitride films and a polymer core, resulting in increased thickness without excessive stiffness. This design significantly amplifies force sensitivity ($\mu\text{V}/\text{nN}$), surpassing standard single-crystalline Si cantilevers by a factor of 4x. Due to the low Q-factor of less than 250 (even in a vacuum), the TLC enables scanning speeds up to 10x faster than those achievable with Si or SiN-CL. Additionally, the electrical insulation of electronic sensors within the SiN/Polymer interface ensures robustness and reliability even in harsh conditions. This feature enables the TLC to function seamlessly in electrically conductive media.



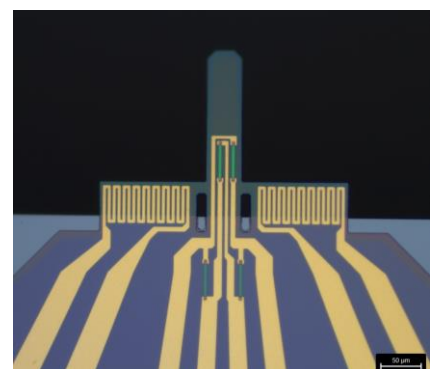
Schematic of the trilayer cantilever (TLC)



SEM image of the TLC (top-view)



Topography image of Highly Ordered Pyrolytic Graphite (HOPG)



Optical image of tip-less TLC (with electrothermal excitation integrated)

Specifications			
Model	Trilayer cantilevers (TLC)		
Material	SiN with a polymer core		
Tip material	Silicon		
Pt metal coating	on the chip body		
Modes	static and dynamic modes		
Selected dimensions*	Res. Freq.	Spring constant	Deflection sensitivity**
$\mu\text{m} \times \mu\text{m} \times \mu\text{m}$	KHz	N/m	$\mu\text{V}/\text{nm}$
220 x 40 x 4	80	2.5	1.5
180 x 40 x 4	120	4.5	2.5
150 x 40 x 4	170	8	3.5
120 x 40 x 4	270	15	5
90 x 40 x 4	480	40	8.5
Deflection sensing	on-chip piezoresistive bridge		
Actuator	external shaker (optional: heater)		
Electrical connections	bonded on a PCB or unbonded		
* Nominal values. For more dimensions, contact us.			
** Not amplified (signal direct at the chip), 1 V bridge supply.			

Applications:

- KPFM and electrical probing, Conductive-AFM (C-AFM) (50 nm Pt-coated tips) and MFM.
- Integration on standard AFM scanner, high-speed AFM.
- Force or deflection measurements.
- Measurements within TEM, SEM, XPS, etc.
Pt coating on the chip body to avoid surface charging.
- Measurements in (opaque/conductive) liquids.

What about your application? Contact us!

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