

# QTM Trilayer Cantilever Probes

Silicon Nitride-Polymer AFM probes: for Quantum Twisting Microscopy

## 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. Coated tip with Pt metal traces for use in Quantum Twisting Microscopy (QTM) experiments.

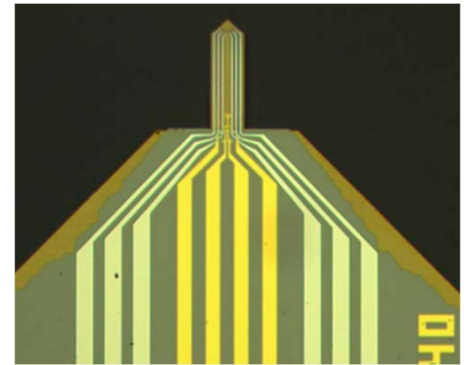


Image of 6 Pt-trace QTM Trilayer Cantilever

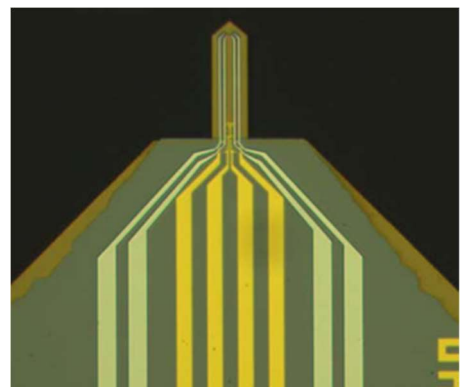


Image of 4 Pt-trace QTM Trilayer Cantilever

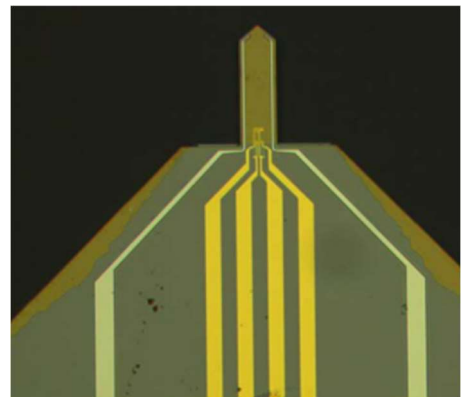


Image of 2 Pt-trace QTM Trilayer Cantilever

Specifications			
Model	QTM Trilayer cantilevers		
Material	SiN with a polymer core		
Tip material	-tipless-		
Pt metal coating	Up to 6 traces to the tip (thickness 70 nm or 140 nm)		
Modes	QTM		
Possible dimensions*	Res. Freq.	Spring constant	Deflection sensitivity**
$\mu\text{m} \times \mu\text{m} \times \mu\text{m}$	KHz	N/m	$\mu\text{V}/\text{nm}$
300x90x4	50	5	1
Deflection sensing	on-chip piezoresistive bridge		
Actuator	external shaker		
Electrical connections	Unbonded		
* Nominal values. For more dimensions, contact us.			
** Not amplified (signal direct at the chip), 1 V bridge supply.			

## Applications:

- Quantum Twisting Microscopy

## What about your application? Contact us!

References: Inbar, A., Birkbeck, J., Xiao, J. et al. The quantum twisting microscope. Nature 614, 682–687 (2023).

