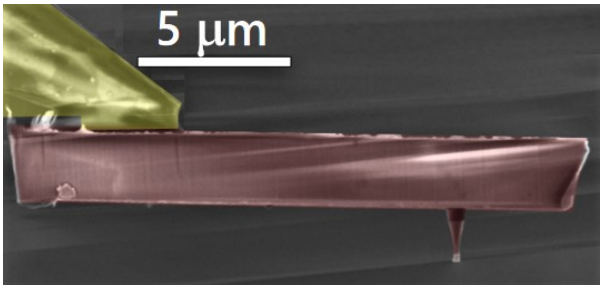
QuantileverMX

Diamond probe with a single NV center

Product leaflet | Release version: December 2019



QuantileverMX™ (SEM) © Qnami 2019

QuantileverMX

Key features

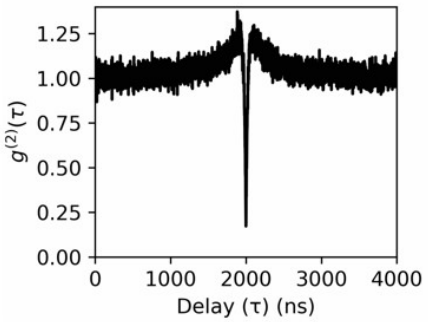
- ☑ Non-perturbative single spin probe (magnetic moment of 2 μ_B)
- ☑ NV depth from the tip apex: down to 10 nm (simulated)
- ☑ NV diamond probe mounted on quartz tuning fork (Q>1000, f=32 kHz)
- ☑ Designed for ProteusQ™ microscope

Product Description

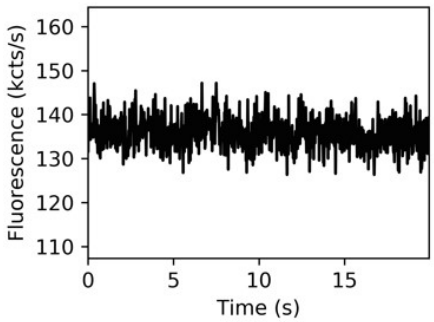
QuantileverMX™ is based on the patented technology developed and owned by Qnami AG in Basel, Switzerland. Each QuantileverMX sensor behaves like a true single-spin momentum, allowing non-perturbative analysis of a large variety of magnetic materials such as antiferromagnetics, multiferroics, nanomagnetism, etc. Combined with the ProteusQ™, the QuantileverMX provides a direct quantitative measurement of the magnetic field with minimal calibration requirements.

Quality Control

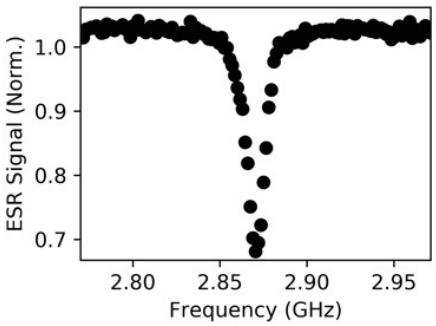
Our Quantilevers are the result of a 6-year optimization of fabrication processes. Each QuantileverMX is carefully characterized using an industry standard and prepared by our team in Switzerland to ensure its highest quality.



a. Single-NV identification



b. Fluorescence stability



c. ESR characterization (typical)

• Qnami AG • Basel • Switzerland • www.qnami.ch

Specifications

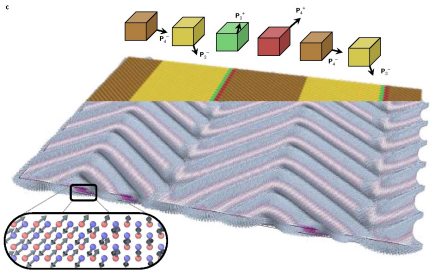
Tuning Fork Sensor

Tuning fork carrier	• Ceramic PCB (6.5 mm × 5.1 mm × 0.4 mm) with 2 gold plated contacts
Mechanical properties	• Q-factor: >1000 (guaranteed), ~2000 (expected using ProteusQ™)
	• Resonance frequency: 32 kHz (typical)

Diamond Probe

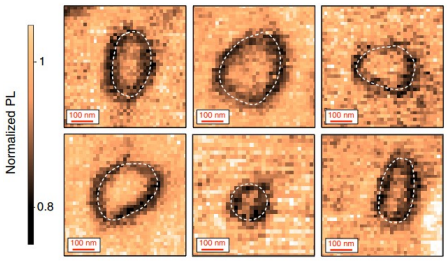
Product packaging	• 1 unit/box
Diamond cantilever geometry	• 19 µm × 6 µm (typical)
Diamond tip apex radius	• 100 nm (typical)
NV lifetime	• up to 6 months
NV center orientation	• 53° (⟨111⟩ orientation with respect to ⟨100⟩ surface)
g^2 (t=0)	• < 0.5
Optical spin readout contrast (in CW ESR)	• > 15 %
T_2^*	• > 1 µsec (typical)

Application examples using Qnami's QuantileverMX™



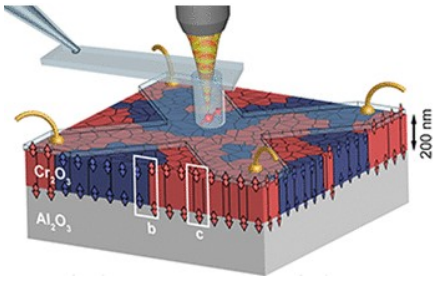
Antiferromagnetic chiral textures in ferroelectric antiferromagnet $BiFeO_3$

Nat. Mater., November 2019 & *Nature* 549, 252–256 (2017)



Magnetic skyrmions on Pt(5nm)/FM/Au(3nm)/FM/Pt(5 nm)

Phys. Rev. Materials, 2, 024406 (2018)



Magnetoelectric granular Cr_2O_3 thin film antiferromagnets

Nano Lett., 19, 1682-1687 (2019)

For international sales, please contact our headquarters in Basel (Switzerland):

Klingelbergstrasse 82, CH-4056, Basel, Switzerland

+41 61 207 3740 | contact@qnami.ch

• Qnami AG • Basel • Switzerland • www.qnami.ch