QZABRE
A new look at surfaces with Quantum Sensing

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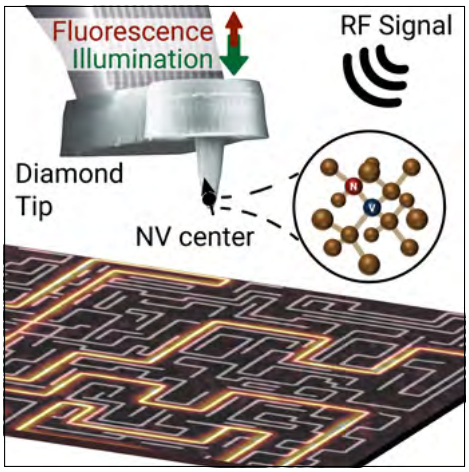
Nanometer-Scale Current Imaging

Quantum-based failure analysis

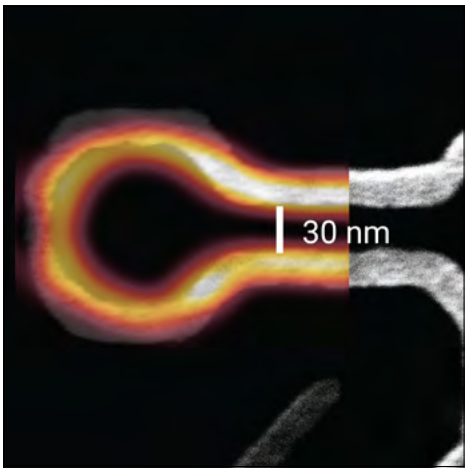
Working principle



An atomic size magnetic field sensor to **quantitatively map current densities** via the magnetic field they create.

Ambient conditions down to cryogenic temperatures and vacuum are accessible.

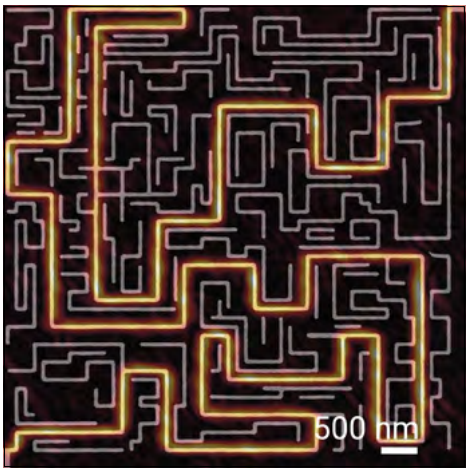
Nanometer scale



Resolution down to 20 nm, determined by sensor-sample distance. **Current sensing down to the nA range**.

Use cases: **Failure localisation**, failure mode analysis and design feedback for FEOL and BEOL.

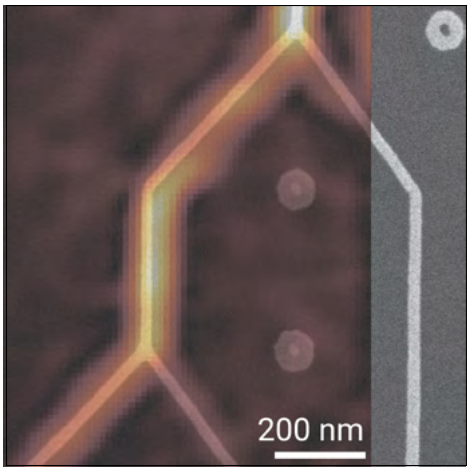
Current density



Get not just a signal trace, but a **quantitative image of the current density distribution** in the conductors.

Use cases: Find hotspots, **current crowding** and possible crosstalk between lines.

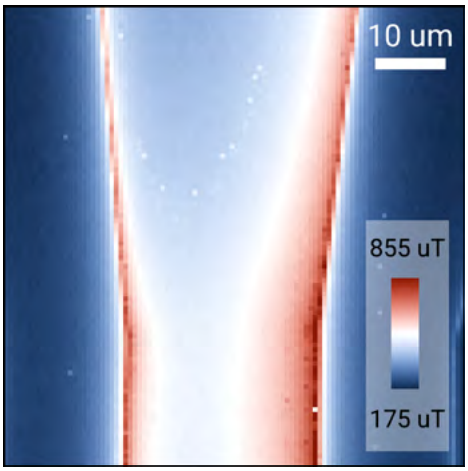
AC current detection



This method detects **AC currents in the kHz to MHz** range with a high fidelity frequency selectivity.

It is therefore possible to **measure a clock line in operations** despite the presence of a DC power delivery nearby.

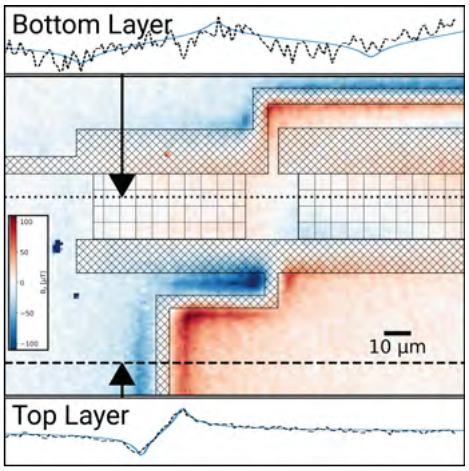
RF fields



NV centers can also quantitatively measure **GHz range magnetic fields and currents**.

The tapered stripline shown is symmetric about its central axis, yet the measurement reveals that the magnetic fields and current flows are not.

3D imaging



We are not limited to the surface:

By combining multiple sources of information, such as the current density profile and the AFM topology, we can **extract information about the 3D current flow** moving between multiple metal layers.

Visit our website for detailed information & use cases.

ZABRE

25+ Quantum Scanning Microscopes installed.
Measurement services available.