

Developing a 4-tip STM operating at 20 GHz and below 1K

In order to probe in-situ prepared Majorana bound states for quantum computation directly after preparation in ultra-high vacuum, a new instrument should be developed, which combines existing expertise in Aachen and Jülich regarding **4-tip STM**, low-temperature STM down to **300 mK** and **time-resolved STM** down to ~ 100 ps.

The instrument will be based on a commercial cryostat and is housed in an acoustically and electrically shielded room, which is located on air-damping legs, at Forschungszentrum Jülich. An existing 4 K-4-tip-STM can be used to proceed with research during the build-up of the new system.

The project is part of the excellence cluster Matter and Light for Quantum Information (ML⁴Q), which has been granted for 7 years starting in 2019. A major goal of the cluster is the realization of scalable Majorana qubits.

The position will be offered for 3.5 years with an option to prolong for another 3.5 years.

The candidate should have a background either in 4-tip STM or in low-temperature STM and skills in construction of new instruments. He will be in charge for Ph.D. students working together with him on the same subjects.

Applications or further information:

Prof. M. Morgenstern (phone: 0241 80-27076)

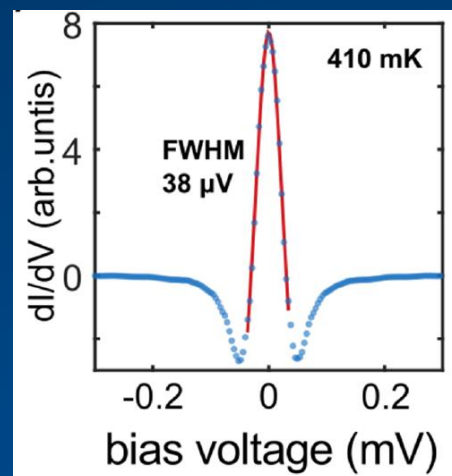
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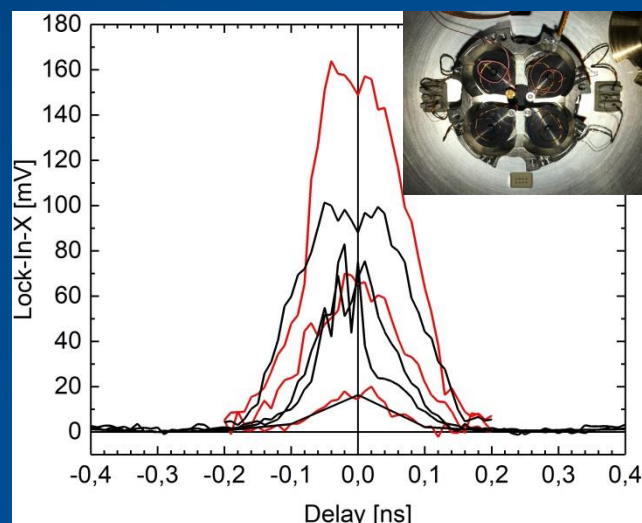
*(Applications must include CV, certificates,
lists of publications and talks,
short description of interest in the subject)*



Four tips on a Si surface



Energy resolution in a 400 mK STM



Time resolution achieved in a 4-tip STM (inset: HF cabling)