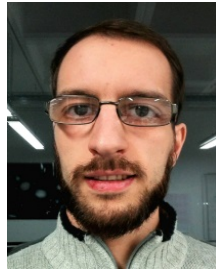


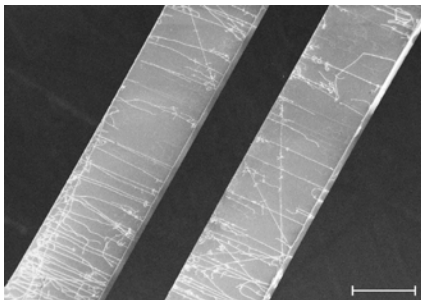
SFB 767 Seminar

12.12.18
13:30
P 912



MSc Patrick Steger
Universität Regensburg

Carbon nanotube transfer into complex devices with commercial quartz tuning forks



CNT growth test on a quartz tuning fork

Carbon nanotubes have attracted research interest over the last years due to their variety of possible applications. Devices with suspended tubes are particularly interesting, since they avoid effects of tube-to-substrate interaction and allow combining the physics of single electron tunneling with the extraordinary mechanical properties of CNTs.

However, fabrication of high quality samples with good yield is still a challenge. While older methods like top contacts and overgrowth have negative impact on the sample quality and limit the choice of materials for the rest of the device, the newer transfer methods are often unreliable or arbitrarily complex. In an attempt of producing good results while keeping the procedure as simple as possible, we have developed a CNT transfer method based on commercial grade quartz tuning forks, which will be presented in this talk.

To prepare the transfer process carbon nanotubes are grown between the tips of our tuning forks (bridging a gap of 140 μm) with standard high temperature CVD. During transfer in-situ measurements allow monitoring of the process and precharacterization of the device, which minimizes the influence of statistics on the sample yield. We use our transfer process to build carbon nanotube mechanical resonators in the vicinity of a superconducting microwave cavity, ultimately aiming for experiments in the field of optomechanics. First characterization measurements at cryogenic temperatures have shown the feasibility of good quality samples.

Contact:
E. Weig, 3770

