

Master thesis

Preparation and transport measurements of coupled Quantumdots in InSb-nanowires

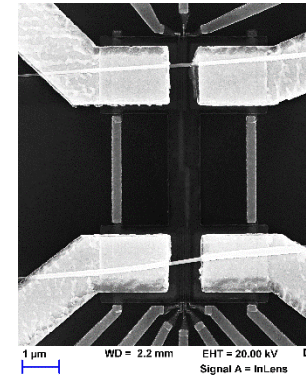
Since the development of scanning tunneling microscopy in 1981, it has become a common tool in surface analysis. Metallic tips are most often used in STM applications. The metallic tip can create unwanted screening effects of the sample. To overcome this downside, our Institute is working on performing STM with a semiconductor nanowire. It was shown that atomic resolution is possible with InAs nanowires (diameter 100nm) [1].

Completely new insights can be gained when a defined quantum dot inside the nanowire is coupled to a nearby charge detector. This setup would allow the counting of single electrons with sub-nanometer spatial resolution. Statistical information of electron transport can be obtained this way.

The main part of the thesis consists of the final cleanroom preparation of InSb nanowire floating gate devices. After that, 300 mK transport measurements are needed to check if the floating gate is suitable for charge detection.

Experience with lithography and other cleanroom processes are of benefit but not mandatory.

Starting time: Immediately



Eine Aufnahme von zwei Nanodrähten (Durchmesser 100 nm) mit Bottomgates aufgenommen mit einem Rasterelektronenmikroskop

[1] K. Flöhr *et al.*, *Apl.PhysLett.* 101, 243101 (2012)