Development of multiple-probe AFM/KFM

Keywords : AFM, KFM, Electrical conductivity

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Background

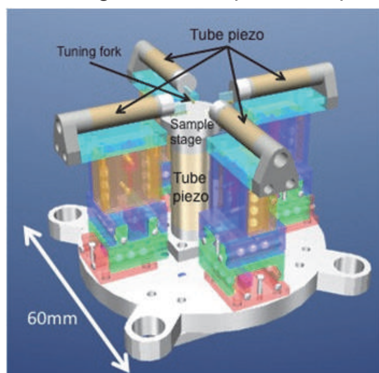
We have developed multiple-probe scanning probe microscope (MP-SPM) to investigate electrical properties of nanomaterials or nanosystems. We have conducted electrical measurement of nanostructures such as metal silicide nanowire and SWCNT using MP-SPM.

Aim

To apply the multiple-probe SPM technique to various measurement environment, we have developed compact four probe AFM/KFM. Non-distractive electrical measurement in nanoscale become possible.

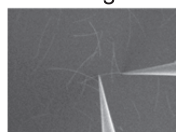
Advanced Research Topics

Schematic diagram of compact multiprobe AFM

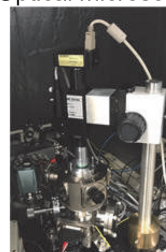


Desktop SEM

SEM image

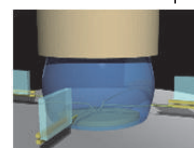


Optical microscope

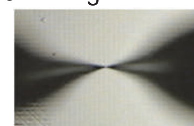


OM image

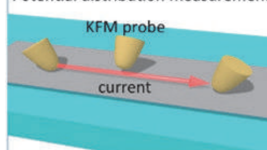
Schematic diagram of measurement in liquid



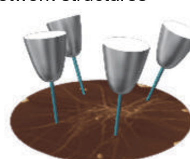
OM image in water



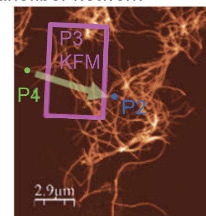
Integrated control system



Local potential measurement of network structures



Local potential distribution of nanofiber network



Publications

- R. Higuchi, Y.Shingaya, T. Nakayama, J.J. Appl. Phys. 55, 08NB091 (2016)
- T. Nakayama et al., Advanced Materials, **24**, 1675(2012)

Summary

- Compact four probe AFM/KFM was developed for electrical measurement of nanomaterials or nanosystems.
- Observation in various mesurement environment such as vacuum, air, gas replacement, liquid is possible.

Research outcome

- Investigation of nanoscale electrical property for development of new nanodevices

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