



News

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How to operate a scanning probe microscope on board a space laboratory or planet exploration rover? - Scientists suggested an approach for remote control of a scanning probe microscope in space.

When using a scanning probe microscope (SPM), for instance on board of a near-Earth station or a planet exploration rover, a number of control-related tasks should be solved. A method is required to exclude the operator from the measurement process that would make the microscope operation completely autonomous.

To reach this goal, the method of feature-oriented scanning (FOS) was suggested in the Solid Nanotechnology Laboratory of the Institute of Physical Problems. The method had successfully proved its capabilities in conditions of an Earth laboratory, in particular, a great increase in measurement precision and considerable improvement of spatial resolution of the microscope.

FOS application under conditions of a space laboratory allows to notably decrease SPM sensitivity to temperature variations. The SPM under FOS control becomes a free-running instrument able of self-testing, self-adjusting and self-calibration, it operates according to the principle “run and forget”. With FOS, the trajectory of the microscope probe movement is not defined beforehand, it is actually being built dynamically during the operation. The behaviour of a microscope probing some unknown sample surface becomes similar to the one of an autonomous rover when it moves across an unfamiliar surface of a planet.

More information:

<http://www.liebertonline.com/doi/abs/10.1089/...>

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