

Scanning Probe Microscope System Design with Fuzzy Control

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Abstract

This research applied both the traditional PI (Proportion and Integration) compensator and the fuzzy control methods for a Scanning Probe Microscope (SPM) system design. In addition, the actuator hysteresis effect was taken into consideration. It can be seen that the system performance obtained by the fuzzy controller was much better, especially in eliminating the actuator hysteresis effect. This improvement has been verified by MATLAB simulation and practical implementation of a surface profiler.

Keyword : Scanning Probe Microscope, force actuator, hysteresis effect, fuzzy controller.