Intelligent Control of a SPM System Design with Parameter Variations

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Abstract

Abstract—This research is to use fuzzy controller in the outer-loop to reduce the hysteresis effect as well as parameter variations of a force actuator for a Scanning Probe Microscope (SPM). This improvement has been verified by practical implementation. Comparisons with a previous design for the outer-loop with PI compensator and inner-loop with Linear Velocity Transducer (LVT) for feedback compensation are also made. Thus the proposed system is more robust.

Keyword：Fuzzy controller, SPM, Hysteresis effect, LVT