

Integration Both PI and PD type Fuzzy Controllers for a Scanning Probe
Microscope System Design

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Abstract

This research is to use a Proportion and Integration (PI) as well as a Proportion and Derivative (PD) type of fuzzy controllers to reduce the hysteresis effect of a force actuator for a Scanning Probe Microscope (SPM). This improvement has been verified by MATLAB simulation and practical implementation to reduce the hysteresis effect of the force actuator. Comparisons with the previous designs with and without Linear Velocity Transducer (LVT) for inner-loop feedback compensation are also made. Thus the new design is cheaper and valuable.

Keyword : PI type fuzzy controller; PD type fuzzy controller; SPM; Hysteresis effect