

Application of optimized higher order sliding mode control on MEMS optical switch

ABSTRACT

MEMS optical switches are used in optical networks in order to provide the desired bandwidth. This paper presents the results of an optimised Higher Order Sliding Mode (HOSM) position controller design. The algorithm requires time derivatives of the sliding variable. A Robust Exact Differentiator is used to estimate time derivatives of the sliding variable. A novel application of Particle Swarm Optimization (PSO) is introduced for optimal tuning of the HOSM controller. Robustness of the controller is investigated and the performance is compared with that obtained by a First Order Sliding Mode (FOSM) controller.