Abstract

Permanent Magnet Synchronous Motor (PMSM) has been gradually more used in industrial application as a result of a rapid dynamic response and precise control. This paper proposed a high performance Field Oriented Control (FOC), which is a closed loop control to get better dynamic performance of the PMSM in addition to improve accuracy speed control.

Two types of controllers are used; the first controller is the Proportional-Integral (PI) and the second controller is a PI-controller founded on Fuzzy-PI controller in terms of reducing steady state error, rising time, overshoot and smoother speed response. Space Vector Pulse Width Modulation (SVPWM) method is considered according to harmonics result and losses.

A MATLAB/SIMULINK program is arranged for simulating the whole drive systems. The simulation results prove the various dynamic operations.


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Index Terms

Computer Science

Fuzzy Systems
Keywords

Permanent Magnet Synchronous Motor (PMSM), Space Vector Pulse width Modulation (SVPWM), Field Oriented Control (FOC), PI controller, fuzzy PI controller.