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.


8. PRAGASEN PILLAY, and Ramu Krishnan, "Control characteristics and speed control Design for a high performance pmsm Drive, IEEE Transaction on power Electronics, VOL 5 NO 2, April, 1990.


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.