DSP-Based Permanent Magnet Synchronous Motor Driving System Design and Implementation Using Variable Structure Control T

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ABSTRACT

This thesis is mainly concerned with the development of a DSP based control system for controlling of a permanent magnet synchronous motor (PMSM) . It gives an in-depth discussion of the new VSS output feedback controller and implementation of the driving system. The sinewave supplies will be completed by the vector control module based on DSP. A modified variable structure control (VSC) is used in controlling of PMSM control system. A modified variable structure controllers is derived to guarantee the existence of the sliding mode by using output feedback only. In terms of linear matrix inequalities, we give a new invariance condition guaranteeing the existence of a linear switching surface such that the system in the sliding mide is not only stable but also completely invariant to mismatched uncertainties under certain conditions. The good performance of responses with a DSP based PMSM control system can be realized by the modified variable structure control theory.

Keywords : Permanent magnet synchronous motor ; Digital signal processor ; Variable structure systems

Table of Contents

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