ELECTRIC DRIVE OPTIMISATION

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ELECTRIC DRIVE OPTIMISATION

by

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DC   Direct Current

AC   Alternating Current

PMBLDC Permanent Magnet Brushless DC Motor

LIST OF SYMBOLS

lim   limit

ABSTRAK

ELECTRIC DRIVE OPTIMISATION

ABSTRACT

CHAPTER 1

INTRODUCTION

1.1 Background

Electric motor can be classified into two major categories which are the DC electric motor and AC electric motor. An AC motor is an electric motor driven by alternating current whereas a DC motor is driven by direct current. There are various types of AC motor which includes induction motor, synchronous motor, eddy current motor and etc. The DC electric motor includes permanent magnet brushed motor, permanent magnet brushless motor, switched reluctance motor and etc.

Electric motor is used in many application which includes in machine for driving the pulley and belts, the conveyor belt, in drilling and lathe machine. Apart from the heavy industry, electric motor is used in home appliances for powering the washing machine, fan, blower of air-conditioner and blender machine. Moreover, electric motor is also used in automobile industry as the starter motor for firing up the internal combustion engine of cars and trucks and last but not least, as the drive train for electric vehicle.

The PMBLDC is a synchronous motor. In other words, the frequency of the magnetic field generated at the stator and the rotor is the same. PMBLDC comes in single-phase, 2-phase and 3-phase configuration which the 3-phase configuration is the most

popular among the three. Unlike brushed motor, PMBLDC does not have brushes for comutation, instead a controller is needed for controlling the rotation of the PMBLDC by sending out AC signal to the PMBLDC.

There are two types of AC signal sent to the PMBLDC for controlling the motor which are the Trapezoidal type and the Sinusoidal type which are dependent to the winding of the stator. In additional to the AC signal, the back EMF and the phase current also follow the same form of the AC signal.

1.2 Research Background

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SCHEMATIC