DEVELOPING SIMULATION MODEL FOR DC MOTOR DRIVE IMPLEMENTING ARMATURE VOLTAGE CONTROL METHOD.

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ABSTRACT

This project is regarding the development of simulation model of a dc drive system implementing armature voltage control method as a means of controlling its speed. The various required transfer functions of the sub-system are first derived and then modeled for simulation using MATLAB/SIMULINK. Results obtain from the simulation analysis will be compared with some known data. This will enable us to verify the reliability of the developed model. Availability of this model will enable future simulation work concerning determination of performance characteristics of the drive system implementing field-weakening method to be possible.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Motors come in many sizes and types, but their basic function is the same. Motors of all types serve to convert electrical energy into mechanical energy. They can be found in VCR's, elevators, CD players, toys, robots, watches, automobiles, subway trains, fans, space ships, air-conditioners, refrigerators and many other places.

The dc motors are motors that run on ***Direct Current*** from a battery or dc power supply. Direct Current is the term used to describe electricity at a constant voltage. The ac motors run on ***Alternating Current***, which oscillates with a fixed cycle between a positive and negative value. Electrical outlets provide ac power. When a battery or dc power supply is connected between a dc motor's electrical leads, the motor converts electrical energy to mechanical work as the output shaft turns.

Direct current (dc) motor have variable characteristic and are used extensively in variable speed drive. Dc motor motors can provide a high starting torque and it is also possible to obtain speed control over a wide range. There are three methods in order to control the speed of dc motor which is armature voltage control (V_a), field control (Φ) and armature resistance control (R_a). The methods of speed control are normally simpler and less expensive than those of ac drives.

Both series and separately excited dc motor are normally used in variable speed drive, but series are traditionally employed for traction applications. Due to commutators, dc motors are not suitable for very high speed application and require more maintenance than do ac motors.