SINGLE PHASE INDUCTION MOTOR STUDIES USING MATLAB

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ABSTRACT

An induction machine is a robust and very widely used industrial machine. As the load varies, the characteristics of the machine will also vary. From this project, we will learn more about these characteristics by using MATLAB software. Simulation of a single phase induction machine will be performed by M-File programming and Simulink. From these simulations, we can study the relationships of the motor such as their torque, slip, line current, frequency and the voltage and current waveforms across the motor.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.0 Introduction

An induction machine is a robust industrial machine. There are many researches been done on this machine. Most of the researches for adjustable speed drive focused on voltage amplitude control. Adjustable frequency drives have not been widely used with single-phase induction motors.

This paper aims to study the behavior of the single phase induction motor's torque and slip characteristic under variable frequency operation. This method will be implemented for the practical adjustable speed of the single-phase induction motor. From this project, we will learn more about these characteristics by using MATLAB software. Simulations of a single-phase induction machine (SPIM) will be performed by using MATLAB and from this simulation, we can study the characteristics of the motor. We will look at torque versus slip curve and line current versus frequency curve.

1.1 Aim of Project

The paper shows that SPIM behave quite differently than the three phase induction motor at low frequency. The characteristics of the induction machine will vary as the load varies [1]. Some of the characteristics are speed, torque, voltage and current. To study and to determine this characteristic, students usually use a formula to get the calculation and the machine characteristics.

In fact, there is another way for the student to determine the characteristics that is by using software called MATLAB. Using this software, the student could use the simulation to get speed, torque, voltage, current and other relative results. Using the simulation, the student also could study the graph of torque versus slip and current versus