STUDY AND ANALYSIS FACTOR THAT CAN IMPROVE THE FRINGING ELECTRIC FIELD (FEF) SOIL MOISTURE SENSOR FOR AGRICULTURE APPLICATIONS

WAN AZLAN BIN HASAN

FACULTY OF ELECTRICAL ENGINEERING

UNIVERSITY TEKNOLOGI MARA

MALAYSIA

DEDICATION

In the name of ALLAH, The Most Generous and The Most Merciful
I would like to dedicate a special dedication to my parents especially to my lovely mum for their encouragement, supports and understanding towards me. Also goes to everyone that involved directly and indirectly in completing this project, thanks for your love and kindness. Not to forget a dedication to my supervisor, Pn. Zaiton Sharif for the continuous support and help.

May ALLAH bless all of us, Amin.

Wassalam.

ABSTRACT

This project aims to study on the effect of the dimension and the width of sense and drive electrode to the sensitivity of the fringing electric filed (FEF) sensors. Fringing electric filed (FEF) sensor has been used for non-invasive measurement of material of properties such as temperature and hardness. FEF also been used to detect existence or concentration of material within the test environment. Using the FEF application the FEF moisture sensor is made to detect the volumetric water content (VWC) in soil. In this study, the simulation and testing has been done to characterize the sensor. The simulation is using Finite Element Method Magnetic (FEMM) while sensor is tests using LCR meter to get capacitance value. Through capacitance value the volumetric water content (VWC) can be measured. Before testing is conducted the sensor needs to fabricate using Printed Circuit Board (PCB). The result between simulation and testing then been compare. The results show the electrode width effect the sensor sensitivity. The sensor sensitivity is high when the electrode width is small.

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INTRODUCTION

1.1 PROJECT BACKGROUND

Agriculture is an industry that is beneficial to humans because it is a developing industrial plants and animals well. It is the practice of crop production and other activities of land. It is the practice of crop production and others land activities. The history of agriculture field start a long time ago which at that time all work is done manually. Nowadays technological have improve sharply result from large scale of cultivation. The machine help human in all process including planting, fertilizing, harvesting and also improves in irrigation system.

In agriculture field, management of irrigation system is important to ensure plant growth is health and free from diseases. Irrigation system is a system of water channels flows to the specific area and needed, even though not a lot of quantity of water supply. Using the exact amount of water at the specific time is good to crop. The crop can free from disease and can grow healthy.

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To monitor soil moisture must know all about the soil like the type of soil, the soil texture and how much water for plants. Soil moisture monitoring can help conserve water and energy, minimize pollution of surface and ground water, and produce optimum crop yields. Efficient scheduling of irrigation water applications gives the highest return for the least amount of water.