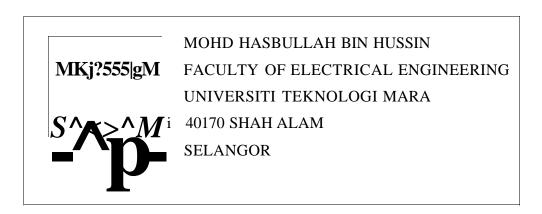
INVESTIGATION OF SEISMO-ELECTROMAGNETIC COUPLING IN DETERMINATION EARTHQUAKE PRECURSORS

Thesis presented in partial fulfillment for the award of the Bachelor of Electrical Engineering (Hons) UNIVERSITITEKNOLOGI MARA



ACKNOWLEDGEMENT

Firstly, praises to Allah S.W.T., for the strength and blessing given to me throughout the entire research and completion of this project. Peace upon our Prophet Muhammad S.A.W. who has given the light to mankind.

I would like to take this opportunity to express my grateful appreciation to my supervisor En. Mohamad Huzaimy bin Jusoh, for the commitment and effort in helping me completing this project. A special thanks to miss Noor Hafizah and Pn. Norsuzila for the guidance during the completion of this project.

I am also lucky to have such a supportive parent that gave me space and always encouraged me in completing this project. They are En. Hussin bin Shamsudin and Pn. Zawiyah binti Yahaya.

Furthermore, a special appreciation to my friends for the time they gave in helping me solving any problems that occurred throughout the research. I would not make it this far without their support, patience and encouragement.

ABSTRACT

Nowadays a non-seismic precursor, seismo-electromagnetic has been busy studied by community that want to prove that earthquake precursors can be determined. Seismo-electromagnetic is the study of electromagnetic phenomena associated with seismic activity such as earthquake and volcano. Electromagnetic component that been studied in this project is the magnetic field instead of electric field. This paper presents simulation analysis and data of two different earthquake events that occurred on 15 November 2006 at Kuril Islands and 27 January 2006 at Banda SEA. Data of magnetic intensity was taken from Space Environment Research Center (SERC) that deployed a system called MAGnetic Data Acquisition System (MAGDAS) through it's Circum-Pan Pacific Magnetometer Network (CPMN) region. Matlab R2007b is used to simulate the data for further investigation and analysis.

TABLE OF CONTENTS

DECLARATION	Hi
DEDICATION	iv
ACKNOWLEDGEMENT	V
ABSTRACT	vi
TABLE OF CONTENTS	vii
LIST OF FIGURES	X
LIST OF TABLES	xi
LIST OF ABBREVIATION	xii

CHAPTER			PAGE
1	INTR	CODUCTION	
1.1	BACK	KGROUND	1
1.2	PROBLEM STATEMENT		
1.3	OBJECTIVES		
1.4	SCOP	E OF PROJECT	3
1.5	RESE	ARCH METHODOLOGY	4
1.6	ORGA	ANIZATION OF THESIS	5
2	LITE	RATURE REVIEW	
2.1	INTR	INTRODUCTION	
2.2	MAGNETIC DATA ACQUISITION SYSTEM (MAGDAS)		6
	2.2.1	MAGDAS/CPMN SYSTEM	7
	2.2.2	MAGDAS/CPMN STATIONS	8
	2.2.3	DATA TRANSFERS	11
2.3	EARTHQUAKE		12
	2.3.1	NATURALLY OCCURING EARTHQUAKES	13
	2.3.2	EARTHQUAKE FAULT TYPES	13
	2.3.3	EARTHQUAKE AWAY FROM PLATE BOUNDARIES	14

	2.3.4	SHALLOW ANDDEEP-FOCUS EARTHQUAKES	15
	2.3.5	INDUCED SEISMICITY	15
	2.3.6	EFFECTS/IMPACTS OF EARTHQUAKES	16
2.4	TECT	ONIC PLATES	19
	2.4.1	KEY PRINCIPLES	20
	2.4.2	TYPES OF PLATE BOUNDARIES	22
2.5	SEISM	MO-ELECTROMAGNETIC	23
	2.5.1	SEISMIC WAVES	24
	2.5.2	ELECTROMAGNETIC	25
	2.5.3	CHARGE CARRIERS	26
2.6	EART	TH'S MAGNETIC FIELD	28
	2.6.1	DIPOLE OFFSET	29
	2.6.2	COMPONENT OF MAGNETIC FIELD	31
	SUM	MARY	32

3 METHODOLOGY

3.1	INTRODUCTION		
3.2	MATI	33	
3.3	METHOD		38
	3.3.1	DATA USED AND PROCESSING	40
	3.3.2	ANALYSIS DATA	44
	SUM	MARY	44

4 **RESULTS AND DISCUSSION**

4.1	INTRODUCTION	45
4.2	ASHIBETSU STATION, JAPAN	45
4.3	PARE PARE, INDONESIA	48
4.4	DISCUSSIONS	51
	SUMMARY	52