



**ESTIMATION OF SKY ILLUMINANCE FOR SOLAR ENERGY  
TECHNOLOGY APPLICATIONS IN MALAYSIA**

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## ABSTRACT

The aim of this project is to produce sky illuminance and sky irradiance for Malaysian sky. Therefore, the sky luminance and sky radiance should be measured first in order to get the instantaneous incident of solar energy which is illuminance and irradiance. Furthermore, illuminance is one of the most important elements in daylight. Therefore, sky scanner is selected to be the equipment that will produce the luminance and radiance data. But, the radiance is also needed in order to determine the ratio of the luminance to radiance which is global luminous efficacy. Then, the value of this ratio will be used to convert the solar radiation to be a global illuminance. The sky scanner is designed to measure luminance and radiance of 145 points of sky dome shaped. The daily measurements had been done from 6.30 am to 6.30 pm every day for one month. The sky scanner required a personal computer in order to install the data from the measurement that had been done. In Malaysia, solar energy studies and applications are considered new. The applications of solar energy in Malaysia can be classified into two categories which are thermal systems and photovoltaic systems. Thermal systems mean the conversion of solar energy into thermal energy and photovoltaic systems mean the conversion of solar energy into electrical energy (Sopian, Yusof, Baharudin, 2000). The latest addition to these categories is the use of natural lighting from solar energy (Zain-Ahmed, 2005). Solar energy is expected to play a very significant role in the future especially in developing countries, but it has also potential prospects for developed countries. Hopefully, the results of the ratio between illuminance and irradiance or luminance and radiance which is around 98.20 lm/ W is very useful in order to develop our country to be more efficient in sustainable development.

## TABLE OF CONTENTS

CONTENTS	PAGE
PAGE TITLE	I
ACKNOWLEDGEMENT	II
ABSTRACT	IV
TABLE OF CONTENTS	V
LIST OF TABLES	VIII
LIST OF FIGURES	X

### CHAPTER I INTRODUCTION

1.0	Background of the study	1
1.1	Solar Energy	
1.1.1	Solar Energy as a Part of the Renewable Energy	2
1.1.2	Sky Types	4
1.1.3	Solar Energy Technology Applications in Malaysia	6
1.2	Malaysia Guidelines for Energy Efficiency in Buildings	7

1.3	Solar radiation and luminance	8
1.4	Illuminance	9
1.5	Objectives of study	10

## **CHAPTER II LUMINANCE AND RADIANCE**

2.0	Overview	11
2.1	Daylight	
2.1.1	Fundamentals of daylighting	12
2.1.2	Luminous efficacy models	15
2.1.3	Luminous efficacy	15
	2.1.3.1 Global Luminous efficacy	16

## **CHAPTER III METHODOLOGY**

3.0	Apparatus	18
3.1	General Description and Characteristics of Sky Scanner	18
3.2	Installation of Sky Scanner at Monitoring Station	20
3.3	Experimental Arrangement	
3.3.1	Preparation before Setting up the Sky Scanner	21
3.3.2	Preparation for Setting up the Sky Scanner	26
	3.3.2.1 Installation of the Sky Scanner	26
	3.3.2.2 Connection of the Sky Scanner	29
	3.3.2.3 The Way the Experiment Was Conducted	30
3.4	Measurement	
3.4.1	Analysis Method	32
3.4.2	CIE Standards	35