

Study of Linear-Correlation Based Solar Irradiance Measurement Device Photovoltaic Application



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Abstract Solar irradiance is the most fundamental element for energy generation from the photovoltaic system. Huge number of measurement instruments are produced commercially for better reading of this parameter. Nevertheless, there are still no detail studies that have ever been reported regarding the critical relationship between solar irradiance and other electrical parameters such as voltage or current in the literature. This study is essential to determine the correct parameters to be considered in developing a precise measurement of solar irradiance. In this study, a linear-correlation based solar irradiance measurement device has been designed to investigate this relationship. The obtained solar irradiance values from the proposed device exhibit an excellent agreement with those measured by the commercial solar meters/sensors which highly suggest that this study should become a trigger for better improvement of the solar measurement system in the future.

Keywords Solar irradiance · Photovoltaic system · Development of solar irradiance measurement device · Study of Linear-Correlation

1 Introduction

Photovoltaic power generation is the way to utilize the energy from the sunlight [1]. Solar energy is converted into electrical energy through photocell. Energy monitoring stations have been developed in order to maintain the reliability of the photovoltaic system so that any malfunctions arise can be solve immediately. Typically, the solar

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