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الى/م.د. ظافر مائع حاجم الحسناوي المحترم

م/ قبول بحث (اللقاء)

تحية طيبة:

نشتمن إرسالكم البحث الموسوم

Experimental Study the Effect of Ambient Temperature on the Performance of Photovoltaic System Work with MPPT Charge Controller in Technical Engineering College of Najaf

للمشاركة في أعمال المؤتمر العلمي الدولي السنوي الثالث للجامعة التقنية الجنوبية. المزمع عقده للفترة من (١٤-١٥) / آذار / ٢٠١٨ ونود إعلامكم بموافقتنا على قبول بحثكم للالقاء في المؤتمر لحصوله التقييم المطلوب. على ان يتم نشره في وقائع المؤتمر بعد اجراء التصحيحات المطلوبة من قبل المقيمين.

يرجى تهيئة عرض شرائح (PPT) للبحث وأرساله لنا في موعد أقصاه أسبوع قبل انعقاد المؤتمر وعلى البريد الالكتروني للمؤتمر وتحديد الباحث الذي سيقوم باللقاء البحث ، علما أن ادارة المؤتمر تستقبل باحثا واحدا لكل بحث. كما نرجوا ارسال سيرة الباحث (CV) وأرسال رقم الهاتف الخاص به على البريد الالكتروني للمؤتمر او التواصل على الرقم (٠٧٧٣٠٤٠٣٠٩٠). ليتسنى لنا الاتصال والتنسيق معه.

تقبلوا منا فائق الشكر والتقدير مع تمنياتنا لكم بالتقدم العلمي

أ.م.د. علاء فريد عبد الاحد

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٢٠١٨ / ٢ / ٢٠



نسخة منه الى //

- اللجنة العلمية
- سكرتارية المؤتمر

Experimental Study the Effect of Ambient Temperature on the Performance of Photovoltaic System Work with MPPT Charge Controller in Technical Engineering College of Najaf

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Abstract- *Solar energy is generated when energy from the sun (sunlight) is converted into electricity or used to heat air, water, or other fluids. Solar photovoltaic (PV) converts sunlight directly into electricity using photovoltaic cells. The ambient temperature one of the important parameter effect on the efficiency of PV system. In the present work, study the effect of ambient temperature, wind speed and solar radiation on the performance of PV system experimentally. Where the experimental work consists of experimental measurement the efficiency of standalone 3 KW PV system with variations the ambient temperature and solar radiation installed in jabir Ibn Haiyan building. AS well as data recording ambient temperature, solar radiation and wind speed, from the weather station located in the Alternative and Renewable Energy Research Unit. The effects of solar radiation, wind speed and ambient temperature were studied on the performance of PV system. During the process of conducting experiments on the PV system in a building (Jabir Ibn Haiyan) show that the ambient temperature effects on the efficiency of the solar system (voltages and power), whereas the higher ambient temperature lesser solar cell efficiency.*

Index Terms— Meteorological Information, Solar energy, PV system

I. INTRODUCTION

As a great potential renewable energy source, solar energy is becoming one of the most important energies in the future. Recently, there has been an enormous increase in the understanding of the operational principle of photovoltaic devices, which led to a rapid increase in the power conversion efficiencies of such devices. Solar cells vary under temperature changes; the change in temperature will affect the power, output from the cells.[1] Used many different PV modules to simulate nominal Operation Cell Temperature (NOCT)for building integration applications, where the yearly modules temperature and performance for different orientations and tilted angles were presented. [2] conducted a study to show that Abu Dhabi has a strong potential for solar energy capture by measuring the solar radiation and surface temperature for one year. [3] Used Fuzzy logic and GIS-based spatial multi-criteria evaluation to conduct an investigation on siting large PV power plant to study the effects of temperature and dust on the performance. [4] Investigated the change on PV panels

temperature by the influence of natural wind cooling and showed that including wind data in the analysis leads to better results and prediction. [5] Presented a study addresses statistical and experimental investigation dealing with the effect of temperature within range of 15-60 °C and intensity levels of 200-500 W/m². The author showed that the current has a proportional relationship to the intensity, whereas the voltage decreases when the temperature increases.

[8] similar study is presented by [5] with different ranges, namely 25-60 °C for temperature and intensity levels of 215-515 W/m². Experimental study the effect of cell temperature in the range 25-60 C at constant light intensities 215-515 W/m² on the photovoltaic parameters of mono-crystalline silicon solar cell. The results show that the open circuit voltage, maximum power, fill factor and efficiency are decreased with cell temperature.

[6] Conducted an experimental investigation to study the effect of dust density, high humidity, rain and snow on the performance of PV panels in the town of Brighton in UK, and showed that these parameters have significant effect and could annihilate any system output.

[7] Proposed numerous models that can be used to predict the relationship between performance of PV system and solar radiation, ambient temperature and wind. Where they showed that the performance is better when the wind speed and solar radiation increase and poor performance when ambient temperature increases.

[9] conducted a study for temperature effect on performance of solar cells that made of silicon thin-film and found that the performance decreases as the ambient temperature increases. [10] Presented a 3D dynamical model to simulate the steady-state dynamic regimes of PVT collector. [11] Used support vector regression (SVR) to study various methods of PV power output prediction. [12] Analytically investigated the effect of ambient temperature on set of PV panels under high solar radiation. [13] investigate the dust accumulation on the PV panels performance in Baghdad-Iraq. [14] A recent work which is presented by [14] investigated the effect of dust and dried mud of the PV modules in the area of Kingdom of Saudi Arabia-Dhahran. [15] They work experimentally to measure the weather ambient temperatures (DBT), solar intensity and wind speed in Najaf city (Iraq 44 oE, 31o N) over a period of one year from April 2015 to March 2016.