شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائق الاصلية تالفة

بالرسالة صفحات لم ترد بالاصل

ADVANCED TECHNIQUES FOR SOLAR PUMPING

By

El-Sayed Mohamed Ali Moslhi Nofal
B. Sc., Agric. Eng., Zagazig University, 1997

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Thesis

Submitted in Partial Fulfillment of
the Requirements for the Degree of

Master of Science

In

Agricultural Mechanization

Soil and Water Department
Faculty of Agriculture
Suez Canal University
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Supervisions Committee

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Soil and Water Department
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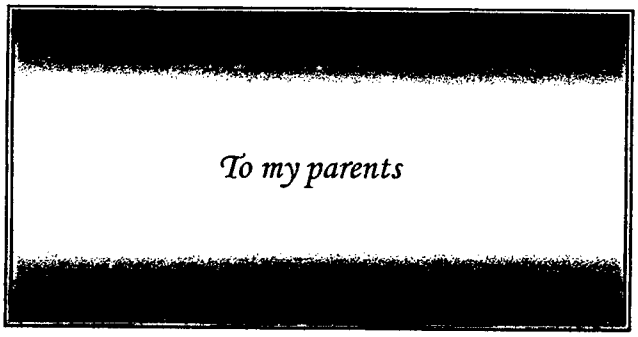
2005


To my parents

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ADVANCED TECHNIQUES FOR SOLAR PUMPING

Abstract

With the rapid decreasing of the reservation of the fossil fuel, a great demand for the alternative resources of the traditional energy. Solar energy is considered one of the most alternative resources of the traditional energy, where Egypt is locate in the solar belt and receives abundant amount of solar energy. Solar energy application in the agricultural processes is required; one of its applications in agriculture is solar water pumping. There are two ways to use solar energy in solar pumping, the first is to convert solar light into electricity by means of photovoltaic cells to operate an electric motor of the electric pump; the second is to evaporate water in a boiler, this vapor is used to operate a steam engine consequently the pump.

A stand-alone solar module operates a pumping system, was built to identify the goals of this study. A 75-Watt solar module used to operate electric motor, which droved a centrifugal pump. The study was to evaluate this pumping technique and study the affecting factors on the performance of these pumps throughout the field and laboratory investigations.

The study was concluded that, there was a directly relationship between the generated hydraulic energy and solar energy, where the daily yield was increased from 0.09 m^3/h to 2.08 m^3/h when the global radiation was increased from 233 Wm^{-2} to 941 Wm^{-2}. Increasing the module surface temperature by one Celsius led to decrease the solar module performance by 0.06%. The study gave the attention towards the solar module tracking, where the daily yield was increased from 17.09 m^3/day when the solar module was stationary-non-tracking to 23.96 m^3/day when it was tracked the sun in tow axis. To maximize the generated hydraulic energy, (the best daily, monthly and yearly tilt angles) were investigated for the study location (Ismailia 31° 58′); a computer program for this propose was developed.

Key words: Solar energy, water pumping, and photovoltaic cells

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