

Higher National School of Hydraulic

The Library

Digital Repository of ENSH



المدرسة الوطنية العليا للري

المكتبة

المستودع الرقمي للمدرسة العليا للري



The title (العنوان):

Modeling and parameter estimation of solar photovoltaic based MPPT control using EKF to maximize efficiency

The paper document Shelf mark P22-8 (: paper version not available)

APA Citation (APA توثيق):

Kerid Rachid, Bounnah Younes (2022). *Modeling and parameter estimation of solar photovoltaic based MPPT control using EKF to maximize efficiency*

. Bulletin of Electrical Engineering and Informatics, vol11 (n°5),P 2491-2499. DOI ou

URL : <https://www.beei.org/index.php/EEI/article/view/3782/2891>

The digital repository of the Higher National School for Hydraulics "Digital Repository of ENSH" is a platform for valuing the scientific production of the school's teachers and researchers.

Digital Repository of ENSH aims to limit scientific production, whether published or unpublished (theses, pedagogical publications, periodical articles, books...) and broadcasting it online.

Digital Repository of ENSH is built on the open DSpace software platform and is managed by the Library of the National Higher School for Hydraulics. <http://dspace.ensh.dz/jspui/>

المستودع الرقمي للمدرسة الوطنية العليا للري هو منصة خاصة بتقييم لإنتاج لأساتذة باحثي المدرسة.

يهدف المستودع الرقمي للمدرسة إلى حصر الإنتاج العلمي سواء كان منشورا أو غير منشور (طروحات، مطبوعات، بيداغوجية، مقالات الدوريات، كتب...) بثه على الخط.

المستودع الرقمي للمدرسة مبني على المنصة المفتوحة DSpace و يتم إدارته من طرف مديرية المكتبة للمدرسة العليا .

كل الحقوق محفوظة للمدرسة الوطنية العليا للري.

Abstract : In this paper, we focus on the design, modeling and implementation of a MPPT controller based maximum power tracking of photovoltaic system. The electrical characteristic of The PV system is non-linear and changes with the solar irradiation and the ambient temperature. Therefore, the incremental conductance (IC) method control is known for its stability and robustness, and is used to extract the maximum energy from the PV source using a boost converter topology. It provides a strong basis for the improvement and optimization of control parameters of a photovoltaic system. Implementing MPPT algorithm usually need the use of a lot of sensors if accuracy of the system has to be increased. However, IC method with an extended Kalman filter (EKF) can be utilized in order to estimate some parameters to reduce the number of Sensors. The EKF is deployed in the optimal position to estimate both current and the capacitor voltage, thus allowing to eliminate two sensors devise from the entire PV system, which increases the system efficiency and reliability, simplifies the control method and decreases the system cost. The performance of the proposed technique is validated by experimental and simulation results under different operating conditions and load changes.

Key words : Efficiency; EKF; Incremental conductance; MPPT; Photovoltaic; Sensor less control

Available from: <https://www.beei.org/index.php/EEI/article/view/3782>