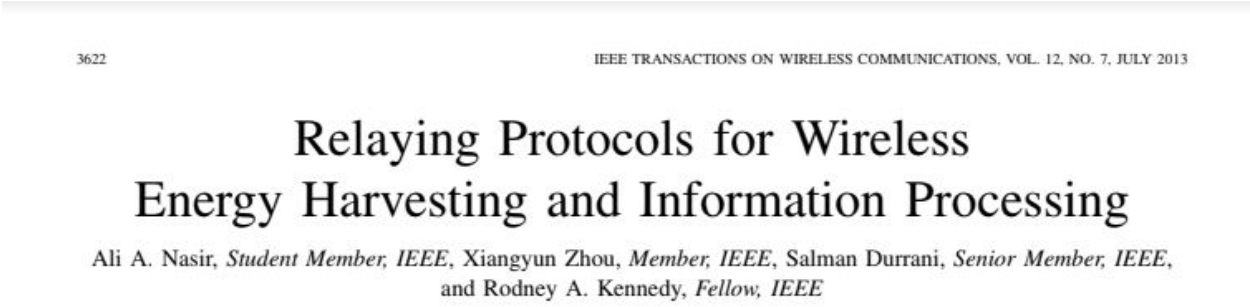
1ST TASK : SIMULATE TSR - PSR PROTOCOL :

We followed the following paper as reference :



Relaying Protocols for Wireless Energy Harvesting and Information Processing

Ali A. Nasir, *Student Member, IEEE*, Xiangyun Zhou, *Member, IEEE*, Salman Durrani, *Senior Member, IEEE*, and Rodney A. Kennedy, *Fellow, IEEE*

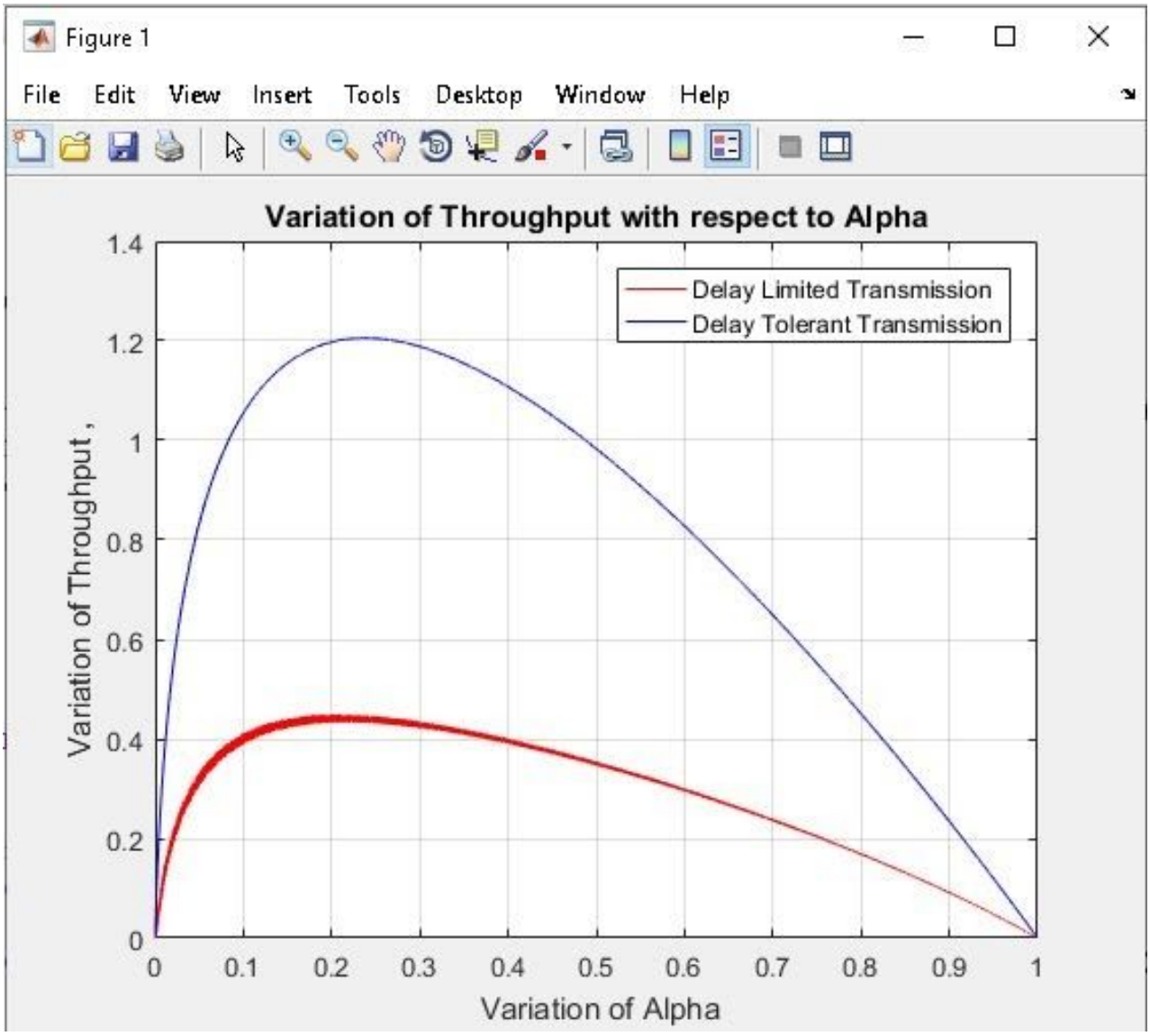
Here are two pdf explaining the codes we used :

https://drive.google.com/file/d/1gAjI8gvnqEeimB6pi9GVwZ8Hx0OkVVOz/view?usp=sharing
https://drive.google.com/file/d/1gEtzlFHyBQ3_VYJlg-Py9zy59Q-Eu41k/view?usp=sharing

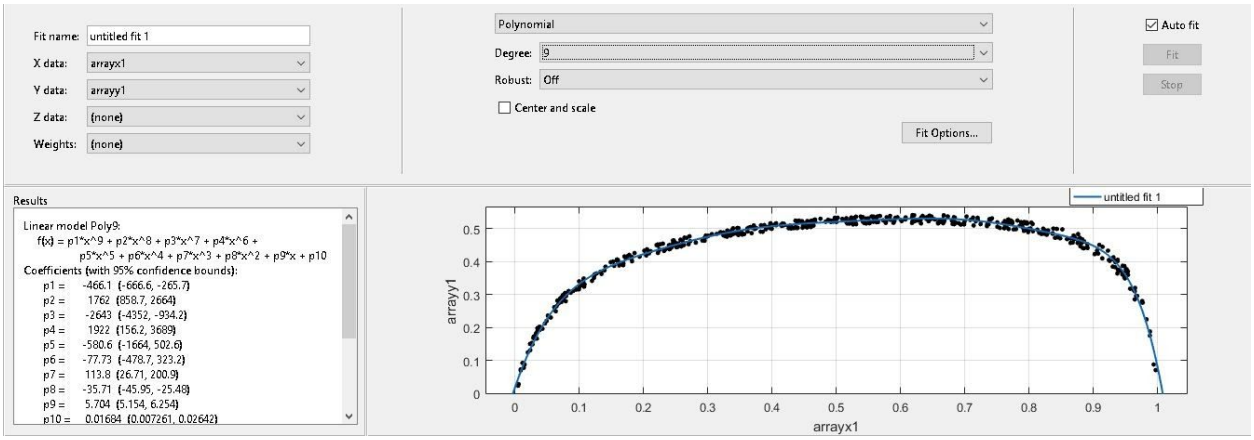
(Note some lines of code by mistake has been replaced by besselj instead of besselk)

Monte-carlo simulation and various techniques are applied for the simulations . Here is the colab link consisting of the MATLAB CODE for TSR protocol :

https://colab.research.google.com/drive/1SD4uHDGa08gpfbfuPkLYJij7vBiNpc7F?usp=sharing



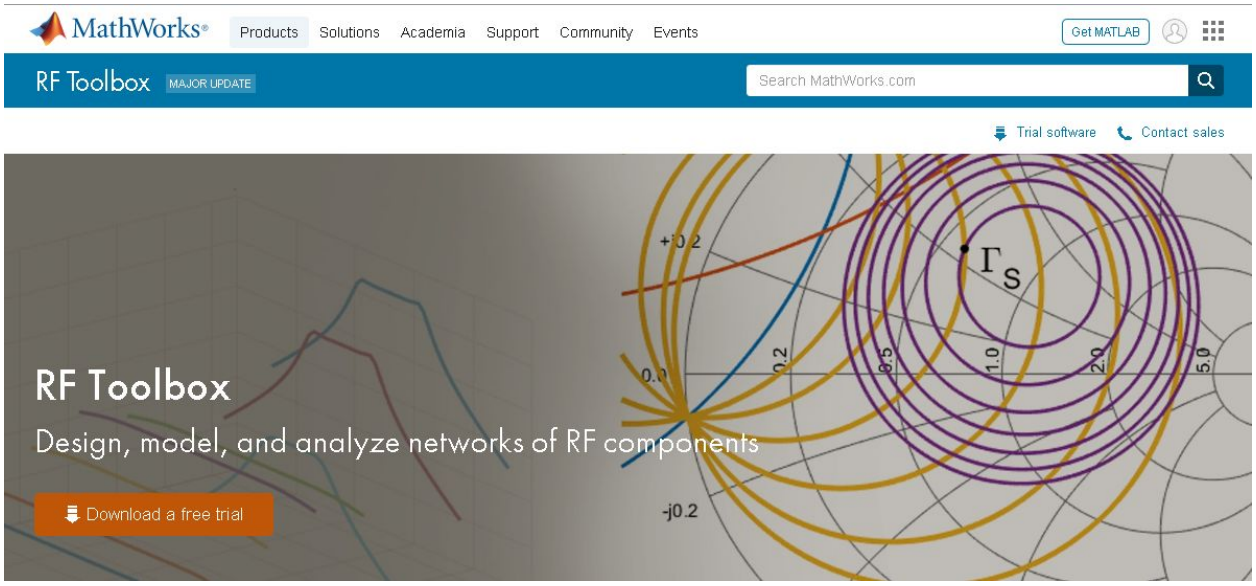
TSR PROTOCOL



PSR PROTOCOL

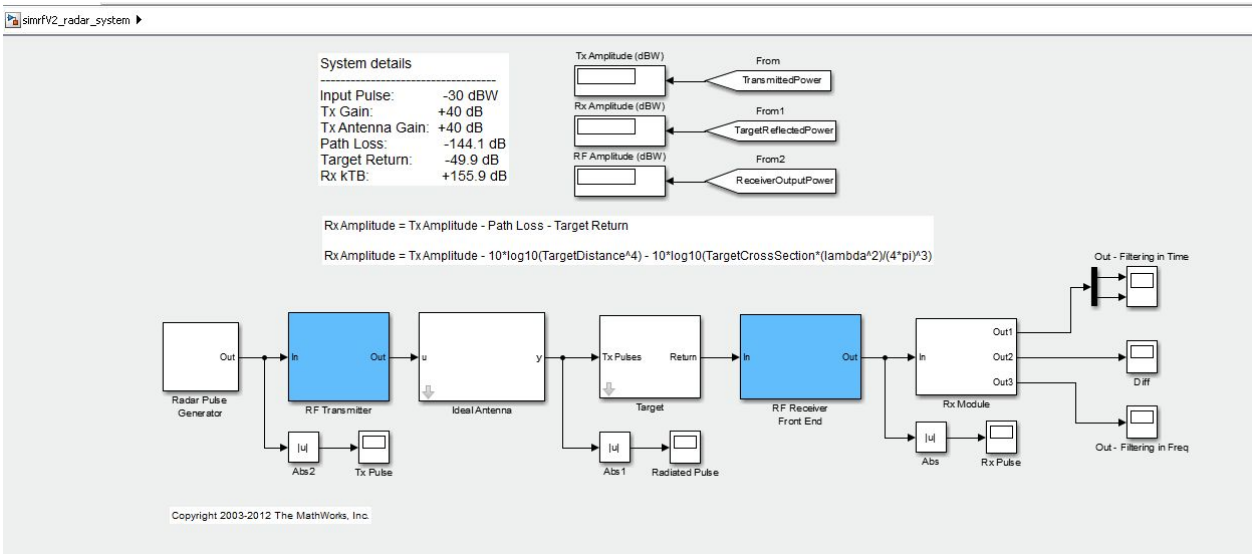
In a similar fashion all the graphs in the given paper have been successfully simulated

For **simulating TSR PSR Protocol in SIMULINK** , We have used the RF toolbox package of MATLAB :



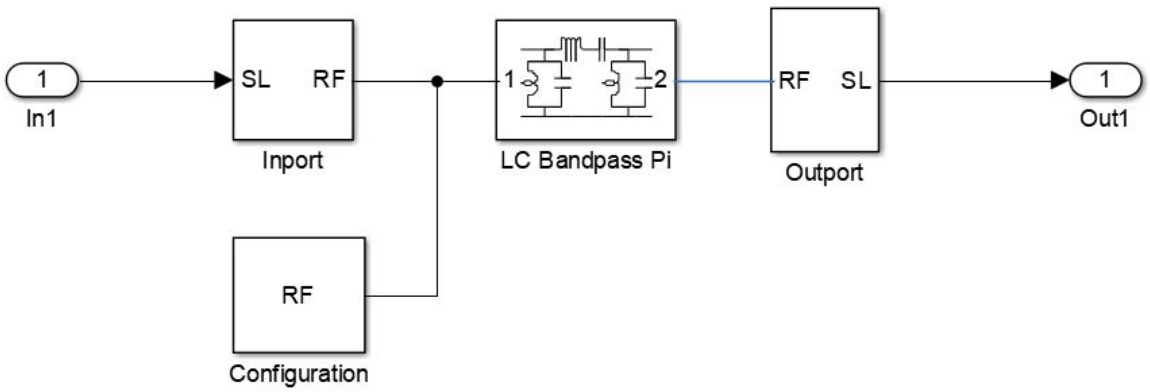
The main difficulty in simulation was the portrayal of RF noise during demodulation of the signal at the relay.

We use certain components of a pre-loaded example model for this purpose :



Simrf_Radar-system-package

The RF noise generator circuit is as follows :



Here is the simulink file for the entire TSR protocol :

https://drive.google.com/file/d/1mlPznLGb6xytAs7mGr_zfvhscX1qbvWY/view?usp=sharing

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Task 2 : Hybrid RF Hybrid Energy Harvesting for UAV :

We are following this paper as a reference :

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Vol. 5, No. 1, 34-39 (2020)
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ASTES Journal
ISSN: 2415-6698

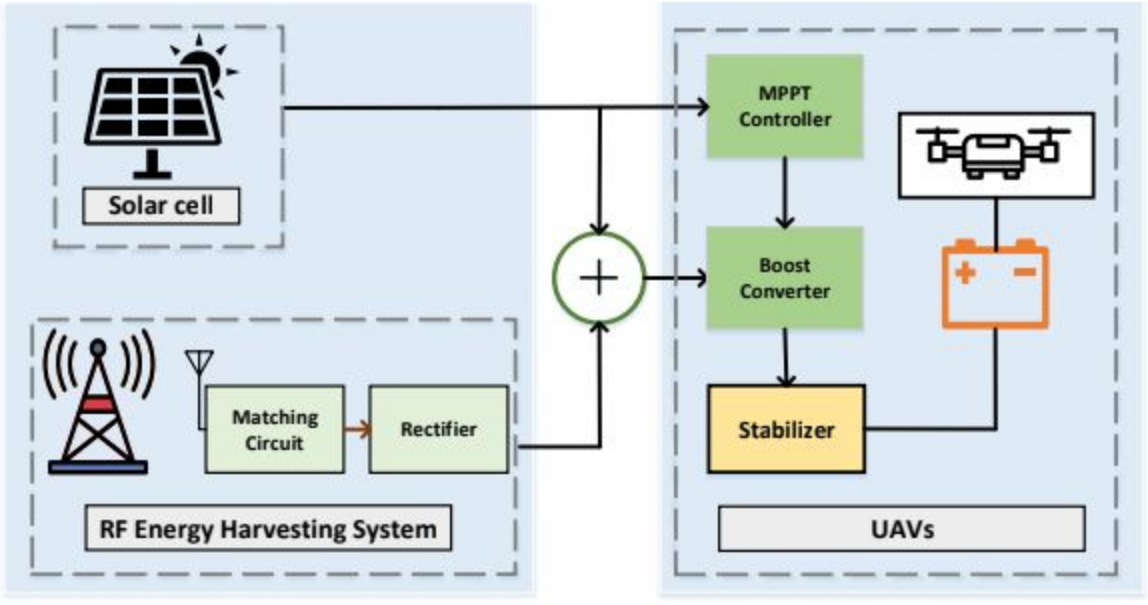
Advanced Hybrid Energy Harvesting Systems for Unmanned Aerial Vehicles (UAVs)

Cuong Van Nguyen[1], Toan Van Quyen[2], Anh My Le[2], Linh Hoang Truong[2], Minh Tuan Nguyen [*2]

[1]*Thai Nguyen University of Information and Communication Technology, Vietnam*

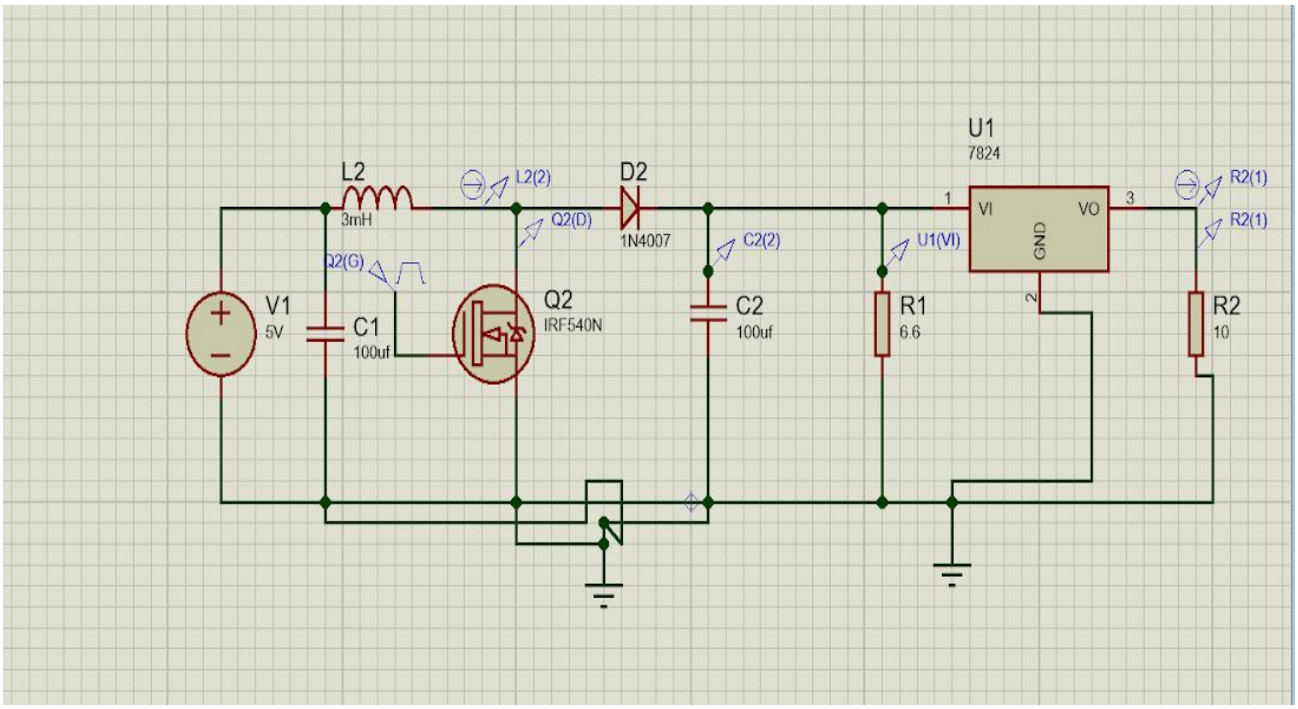
[2]*Thai Nguyen University of Technology, Vietnam*

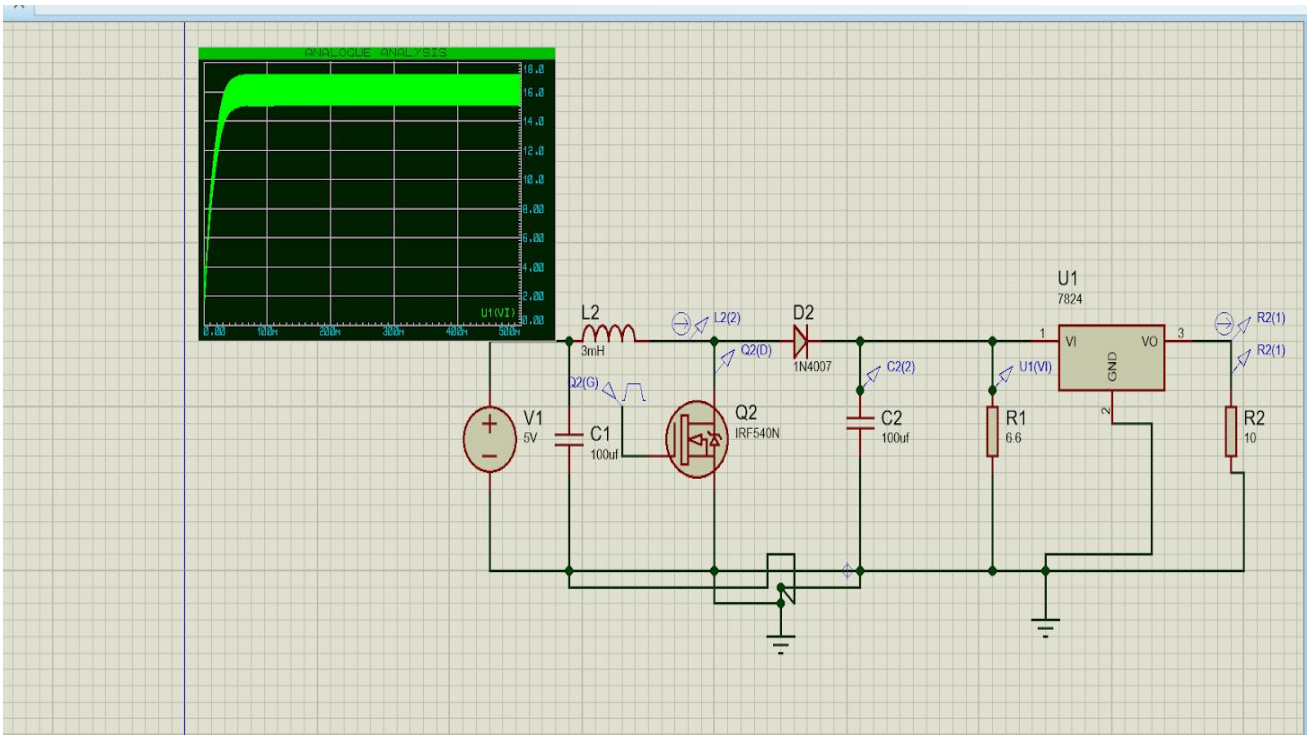
We **first** focus on designing the booster circuit and the MPPT controller for this task :



MPPT CONTROLLER (DC to DC boost convertor) :

The proteus circuit is as follows :





For the Simulink circuit I was heavily inspired by the following paper :

DC-DC Boost Converter with Constant Output Voltage for Grid Connected Photovoltaic Application System

Pui-Weng Chan, Syafrudin Masri
Universiti Sains Malaysia
E-mail: edmond_chan85@hotmail.com, syaf@eng.usm.my

Abstract

The main purpose of this paper is to introduce an approach to design a DC-DC boost converter with constant output voltage for grid connected photovoltaic application system. The boost converter is designed to step up a fluctuating solar panel voltage to a higher constant DC voltage. It uses voltage feedback to keep the output voltage constant. To do so, a microcontroller is used as the heart of the control system which it tracks and provides pulse-width-modulation signal to control power electronic device in boost converter. The boost converter will be able to direct couple with grid-tied inverter for grid connected photovoltaic system. Simulations were performed to describe the proposed design. Experimental works were carried out with the designed boost converter which has a power rating of 100 W and 24 V output voltage operated in continuous conduction mode at 20 kHz switching frequency. The

the system because battery banks need high maintenance which had to be handled carefully in order to have a long lifetime and safe environment. Besides, batteries are the second major cost contributor for the system [2]. Therefore, the exclusion of batteries as the energy storage is economically advantageous [3].

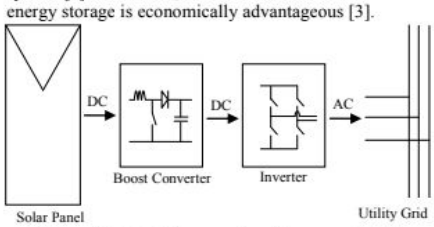
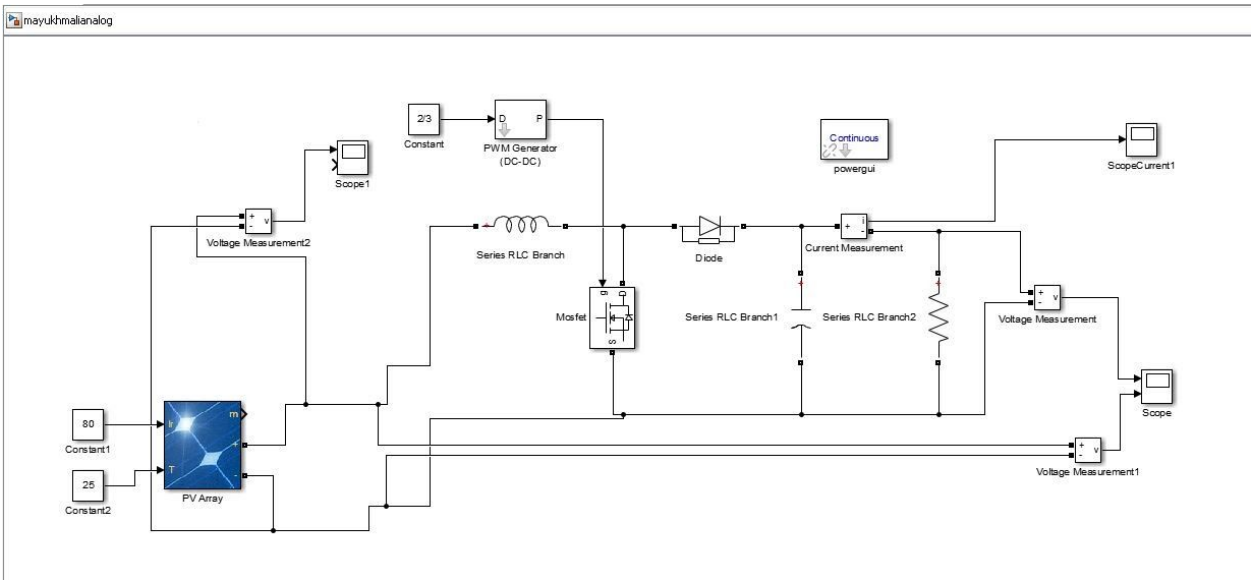


Figure 1. Block diagram of a grid connected PV application system.

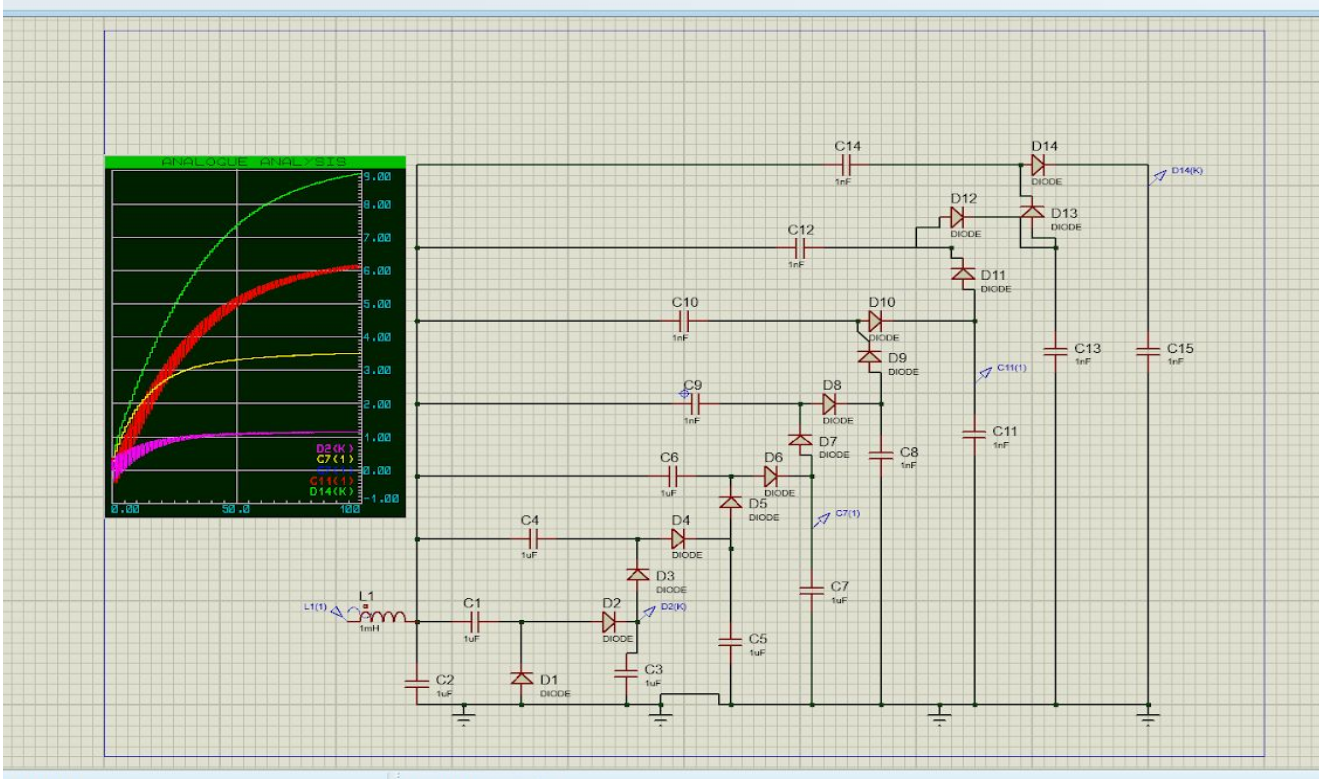
The circuit is as follows :



The simulink file is as follows :

https://drive.google.com/file/d/1ImLNTfC9QQ9DrPZAHkyG6kOadJuop9l6/view?usp=sharing

Booster Circuit (7 stage voltage multiplier circuit) :



The proteus codes are follows :

https://drive.google.com/file/d/1UcSta_pOOGVLFyLYgAA9IW-y4t5ZyuUF/view?usp=sharing

https://drive.google.com/file/d/1av6ofOqCq-CXY0ezd9Ejj5RChk7kTROj/view?usp=sharing

More work is being done which will be updated here as soon as possible . Thank you !