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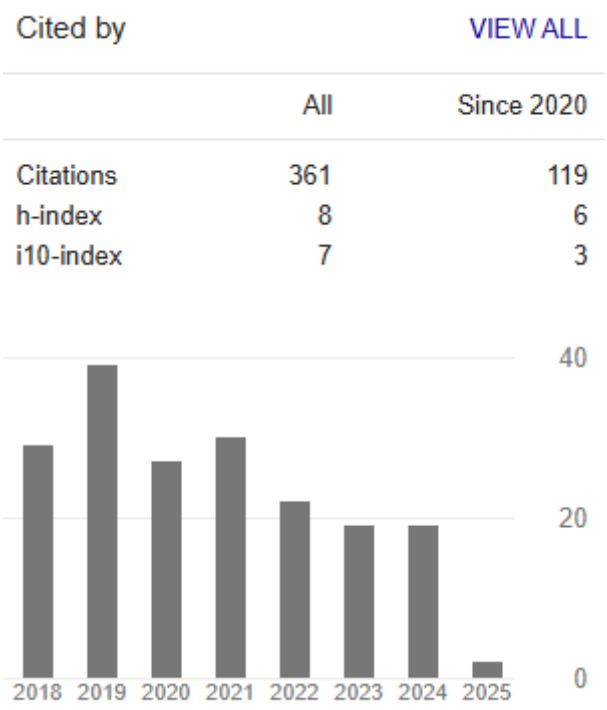

SINGLE-DIODE PV CELL MODELING AND STUDY OF CHARACTERISTICS OF SINGLE AND TWO-DIODE EQUIVALENT CIRCUIT

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ABSTRACT

This paper presents characteristics of ideal single diode, practical single diode and two diode equivalent circuit models for modeling of solar photovoltaic cell. Then it presents non-linear mathematical equations necessary for producing I-V and P-V characteristics from a single diode model. A flowchart has been made for estimation of cell current using Newton-Raphson iterative technique which is then programmed in MATLAB script file. A typical 120W polycrystalline solar module specifications have been used for model evaluation. The characteristic curves were obtained with the use of manufacturer`s datasheet which shows the precise correspondence to the model.

KEYWORDS

Single Diode, Two Diode, I-V and P-V characteristics, solar irradiance

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LOAD SHEDDINGTECHNIQUES FOR SYSTEM WITH COGENERATION: A REVIEW

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ABSTRACT

In developing countries a large demand of power will be seen in future. It is essential to maintain power continuity and reliability. Contingencies like fault occurrence and generated power and load demand imbalance causes system frequency instability. Load-shedding is the ultimate solution to restore system frequency and ensure availability of electrical power to critical loads in the plant. This paper presents a review of traditional adaptive and computational intelligent load shedding scheme. A comparison of these entire schemes with corresponding advantages and disadvantages is summarized.

KEYWORDS

Under frequency; contingency; critical load; load shedding

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STUDY OF SPIN TRANSFER TORQUE (STT) AND SPIN ORBIT TORQUE (SOT) MAGNETIC TUNNEL JUNCTIONS (MTJS) AT ADVANCED CMOS TECHNOLOGY NODES

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ABSTRACT

Magnetic Random Access Memory (MRAM) is a promising candidate to be the universal non-volatile (NV) storage device. The Magnetic Tunnel Junction (MTJ) is the cornerstone of the NV-MRAM technology. 2- terminal MTJ based on Spin Transfer Torque (STT) switching is considered as a hot topic for academic and industrial researchers. Moreover, the 3-terminal Spin Orbit Torque (SOT) MTJ has recently been considered as a hopeful device which provides an increased reliability thanks to independent write and read paths. Since both MTJ devices (STT and SOT) seem to revolutionize the data storage market, it is necessary to explore their compatibility with very advanced CMOS processes in terms of transistor sizing and performance. Assuming a good maturity of the magnetic processes that would enable to fabricate small junctions, simulation results show that the existing advanced sub-micronic CMOS processes can drive the required writing current with reasonable size of transistors confirming the high density feature of MRAMs. At 28 nm node, the minimum transistor size can be used by the STT device. The SOT device shows remarkable energy efficiency with 6× improvement compared with the STT technology. Results are very encouraging for future complex hybrid magnetic/CMOS integrated circuits (ICs).

KEYWORDS

MRAM, Magnetic Tunnel junction, Spin Hall Effect, Spin Orbit torque, Spin Transfer torque

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INVESTIGATE THE OUTPUT BEHAVIOR OF ALKALINE FUEL CELL'S (AFC'S) PARAMETERS : FLOW RATE & SUPPLY PRESSURE

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ABSTRACT

The emergence of fuel cells for the engender of electricity for transferable, compact as well as cosmic, static and automotive purposes prophesies radical changes in electricity supply over coming decagon. This paper presents a study of output behavior of an Alkaline Fuel Cell (AFC) parameters, like flow rates as well as supply pressure. A substantial dispense of research has taken place on fuel cells, which manipulate hydrogen as well as oxygen as their fuel. One of the main objectives for this interest is that fuel cells propound the best criteria for encountering the stipulations of zero emission vehicles, and thus are expected to be the prime users of hydrogen in the alongside future. A 2.4 kW – 48 Vdc AFC Simulink model is employed in this analysis and observe how the output behaves.

KEYWORDS

AFC; Fuel flow rate; Air flow rate; Fuel supply pressure; Air supply pressure; Simulink; MATLAB

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MULTIFUNCTION FILTER DESIGN USING BDQFG MILLER OTA

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ABSTRACT

In this paper, a low power bulk-driven quasi-floating gate MOSFET based Miller compensated Operational Transconductance Amplifier (OTA) is proposed required particularly in design of Gm-C filter. The analysis of amplifier is compared with low power bulk-driven technique. The performance comparison indicates that bulk-driven quasi floating gate configuration offers better performance. In this configuration the combination of bulk-driven input with quasi-floating gate results in improved transconductance and hence results in high gain and UGB of the OTA. Moreover, simulation of the bulk-driven quasi-floating gate OTA does not suffer from DC convergence problem. A voltage mode multifunction 2nd order filter design based on proposed BDQFG OTA is also presented. The analysis of all the circuits have been carried out in industry specific node UMC 0.18 micron technology with the help of HSpice simulator.

KEYWORDS

Bulk driven, Bulk driven QFG, Transconductance, Bandwidth, OTA, filter

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MODELLING AND SIMULATION OF SOLAR PHOTOVOLTAIC SYSTEM AND INTERFACING WITH CLOSED LOOP BOOST CONVERTER AND NEUTRAL POINT CLAMPED MULTILEVEL INVERTER

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ABSTRACT

In the power generation sector, Natural Resources like Solar, Wind, Tidal, Geothermal, Hydro etc have always played a very important role. Out of these solar PV (photo voltaic) is most popular due to its significant advantages. Controlling the output of solar PV system and harmonics at the load end are key aspects. The main theme of this paper is to control output of solar PV system with the help of PI controller and reduction of harmonics at the load end by using Neutral Point Clamped Multilevel Inverter. In this paper, commercial solar arrays of 1.2 kW along with close loop boost converter have been interfaced with neutral point clamped multilevel inverter. In this paper mathematical model of PV system have been presented and the characteristic of pv cell have been verified experimentally with the help of solar simulator under varying climate and load condition. Also, design and simulation of a Boost converter which works in continuous conduction mode (CCM) using Solar PV array voltage as input has been done. PV model has been interfaced with Multilevel inverter (MLI) and the results for three level, five level, seven level, nine level and eleven level are presented. Models have been developed for different level of inverter in MATLAB to achieve this purpose.

KEYWORDS

solar PV array, close loop boost converter, PI controller, Neutral point clamped multilevel Inverter

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TUNABLE FREQUENCY SURFACE DESIGN BETWEEN 2.43GHZ AND 6GHZ

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ABSTRACT

Reconfigurable frequency selective surfaces (FSSs) which have more than one frequency response are demanded by recent communication systems. Tuneable FSS design is presented as a solution proposal to these demands in this work. Four-legged loaded element geometry is modified in order to achieve wide tuning range by inclusion of varactor diodes. Frequency tuning range is increased %11 by comparing with the “Four Legged Loaded” element geometry. Achieved results show that proposed structure allows tuning between 2.42GHz-5.94GHz frequency bands. Analyses are executed with Ansoft HFSS v.15 software.

KEYWORDS

Frequency selective surface, FSS, periodic structures, active FSS, reconfigurable FSS, varactor diodes

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STUDY OF THE SENSORLESS SWITCHED RELUCTANCE MOTOR CONTROLLER BASED THE SIMPLIFIED FLUX METHOD

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ABSTRACT

Tradition of the simplified flux method has the characteristics of simple and quick, small memory, but it exists coupling when the phase switch. According to the basis of the simplified flux, the author creates a new method named the turn-on and turn-off simplified flux method. The method is based on fixed turn-on angle and turn-off angle as the prerequisite, and estimates on and off position of the sensorless switched reluctance motor. Under the environment of Matlab/Simulink, the method realizes the sensorless control of the switched reluctance motor.

KEYWORDS

switched reluctance motor, sensorless detect, the simplified flux method, the turn-on and turn-off simplified flux method, control.

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DESIGN OF MATCHED FILTER FOR RADAR APPLICATIONS

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ABSTRACT

The aim of this paper is to present the details of signal processing techniques in Military RADARS . These techniques are strongly based on mathematics and specially on stochastic processes. Detecting a target in a noisy environment is a many folds sequential process. The signal processing chain only provides to the overall system boolean indicators stating the presence (or not) of targets inside the coverage area. It is part of the strategical operation of the radar. This paper mainly focuses on Design of Matched filter and generation of chirp Signal.

KEYWORDS

RADAR, Boolean indiactors, Chirp Signal, Matched Filetr, Strategicial Operation

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THE EFFICIENCY ESTIMATION OF 900 MHZ RF ENERGY HARVESTER USING ARTIFICIAL NEURAL NETWORK

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ABSTRACT

In recent years, there is a significant increase in the number of devices with low power consumption. The energy requirements of these devices are provided by chemical batteries. The batteries must be charged at regular times, and cause some problems such as environmental pollution. RF energy harvesters are an alternative energy source for the batteries. In this study, the responses of 900 MHz RF energy harvester, which was previously tested, are estimated using an Artificial Neural Network (ANN) method in different states. For this aim, the output power values are determined by using the input power and the frequency of the signal and the load resistances connected to the energy harvester.

KEYWORDS

RF Energy Harvester, Artificial Neural Network, Efficiency

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