ISBN(softcover): 978-3-03785-782-3 ISBN(eBook): 978-3-03826-163-6

Table of Contents

Preface and Committees

Chapter 1: Utilization of Alternate Energy for Sustainability

Analysis of Three Port Full Bridge and Half Bridge DC-DC Converter Interfacing Renewable Energy System
M. Venmathi and R. Ramaprabha 3

Comparative Analysis of Solution Methods to Power Electronic Interface Modeling for Renewable Energy Applications
D. Randhir, S. Umashankar, D. Vijayakumar and D.P. Kothari 9

Investigation of PMSG Fed Diode-Clamped Multilevel Inverter for Wind Energy System
A.B. Sankar and R. Seyezhai 16

Modeling of Photovoltaic Array and Simulation of MPPT Algorithm
G. Rohini, V. Jamuna, M. Abirami and R. Ramprakash 23

A Review of Mathematical Models for Performance Analysis of Hybrid Solar Photovoltaic - Thermal (PV/T) Air Heating Systems
P. Baskar and G. Edison 29

Structural Analysis of a Wind Turbine Blade
A. Benham, K. Thyagarajan, S.J. John and S. Prakash 40

Application of Particle Swarm Optimization Technique for the Design of Maximum Power Point Tracking
R. Venugopalan, N. Krishnakumar, R. Sarjila and N. Rajasekar 47

Application of Wind Energy Source to Large Scale Desalination System Prefeasibility Analysis-Investigation of Wind Power Potential in Coastal Areas of Tamilnadu
B.S. Saravana and V. Rajini 57

Performance Analysis of Flat Plate Solar Water Heater by Changing the Heat Pipe Material
P. Sivakumar, W.C. Raj, N.J. Malathi and S. Balakrishnan 64

Effect of Working Pressure on Structural, Electrical and Optical Properties of CIGS Thin Film Deposited by PLD
P.K. Mishra, Y.K. Gautam, J.N. Prasad, A.K. Choudhary and R. Chandra 70

Modelling and Simulation of 3-phase Transformerless Split Inductor Multilevel Inverter for Grid Connected Photovoltaic System
C. Bharatiraja, R. Palanisamy, S. Sadagopan, R. Latha and S.S. Dash 75

Implementation of a Low Cost Resonant Boost Converter Connected Photo Voltaic System
R.C. Ilambirai and R. Boga 80

Three Phase Hybrid 7-Level Inverter with 60 Degree PWM Scheme for PV Applications
R. Abirami, V. Jaikrishna, N. Chellammal, D.S. Subhransu and V. Velmurugan 84

Performance Studies on Solar Photovoltaic Thermal System for Crop Drying
M.B. Gorawar, P.P. Revankar, V. Tambrallimath and K. Shekar 90

Development of Computational Technique for Better Utilization of Renewable Energy
R.P.J. Kiruba and R. Arulmozhiyal 98

Influence of Source - Substrate Distance of Cu_4SnS_4 Thin Films Grown by Co-Evaporation
V.P.G. Vani, M.R.V. Reddy and K.T.R. Reddy 103

Simulation and Hardware and Implementation of Directly Coupled Four Phase Interleaved Boost Converter for Fuel Cells
M. Tamilarasi and R. Seyezhai 109

Development and Field Test Performance of a Non-Conventional Unidirectional Co-Axial Two Series Rotors Micro Wind Turbine
S.A. Kale and S.N. Sapali 119

Maximum Power Point Tracking Based on Look Up Table Approach
S. Malathy and R. Ramaprabha 124

Sensorless Control of PMSG Wind Turbine Using ANFIS
A.D. Janarthanan, L. Venkatesan and G. Muruganandam 131

Design and Modeling of Photovoltaic System Fed Brushless DC Motor
M. Pandikumar, R. Ramaprabha and R. Muthu 136

Cost Effective Wind Energy Conversion Scheme Using Self-Excited Induction Generator
K. Subramanian and S.P. Sabberwal 143

Performance Evaluation and Exhaust Emission Analysis of a CI Engine Fuelled with Pongamia Pinnata Biodiesel and its Blends
G.A. Miraculas and N. Bose 151

Experimental Analysis of Energy Recovery from an Internal Combustion Engine Exhaust Using Rankine Cycle
C. Bibin and P. Seenikannan 158

Experimental Investigation of Nano Particles Blended with Water on Solar Flat Plate Collector
P. Sivakumar, W.C. Raj, N.J. Malathi and R. Balamurugan 164

Chapter 2: Energy Efficient Automotive Technologies

Spray Characteristics of Diesel and Biodiesel in Direct Injection Diesel Engine
P. Raghu, K. Thilagan, M. Thirumoorthy, S. Lokachari and N. Nallusamy 173

Experimental Study on the Spray Characteristics of Diesel and Biodiesel (Jatropha Oil) in a Spray Chamber
P. Raghu, M.S. Mukilan, R.B. Viswanath, S.A. Krishna and N. Nallusamy 180

Effect of DEE Injection in Pongamia Pinnata Biodiesel Fulled CI Engine Using Hydrogen as Secondary Fuel
C. Jegadheesan, P. Somasundaram, B. Meenakshipriya and U.P. Vignesh 188

Development of Energy Saving and Environment Friendly Aluminum Hybrid Composite Materials for Vehicle Applications
N. Tiruvenkadam, P.R. Thyla, M. Senthilkumar, T.D. Bosco, A. Srikanth and S.S.I. Faiyaz 195

Performance Improvement on a Single Cylinder Diesel Engine Powered with Pongamia Biodiesel by Incorporating Swirling Grooves
J.I.J.R. Lalvani, M. Parthasarathy, A.V. Arunkumar and K. Annamalai 199

Influence of Dual Fuel Twin Injection on Diesel Engine Combustion and Emission Characteristics
K.S. Kumar and R.T.K. Raj 206

Mechanical Modifications to Convert Small Two Strokes Carbureted Engine to Electronic Fuel Injection System Engine to Reduce Emission and Fuel Consumption
K.D. Sapate and A.N. Tikekar 213

Comparison of Performance and Emission Characteristic of Tamanu, Mahua and Pongamia Biodiesel in a Di Diesel Engine
M. Parthasarathy, J.I.J.R. Lalvani, B. Parthiban and K. Annamalai 218

Numerical Investigations of Spray Droplet Parameters in a Direct Injection Diesel Engine Using 3-Z Extended Coherent Flame Model
M. Renganathan and R.T.K. Raj 226

Analysis and Experimentation of a Three Phase Asymmetric Cascaded Multilevel Inverter for Electric Vehicles
R. Seyezhai, K.R. Sree, K. Sivapathi and V. Vardhaman 231

Investigations on the Effect of Bio Fuel Enhancer Additive with Cashew Nut Shell Liquid Biodiesel Blends on Engine Performance and Pollutant Emissions in a Diesel Engine
T. Pushparaj, C. Lalithmuneendirakumar and S. Ramabalan 238

Performance and Emission Characteristics of Low Heat Rejection Diesel Engine Fuelled with Rice Bran Oil Biodiesel
G. Arunkumar, A. Santhoshkumar, M. Vivek, L.A. Raman, G. Sankaranarayanan and C. Dhanesh 245

Effects of Compression Ratio on Performance and Emission of Internal Combustion Engine with Used Vegetable Oil Methyl Easter
N. Balakrishnan, K. Mayilsamy and N. Nedunchezhian 250

Experimental Studies on Performance and Emission Analysis in Diesel Engine Using Bio-Fuel (Neem Oil)
N. Kanthavelkumaran and P. Seenikannan 255

Chapter 3: Energy Efficient Manufacturing Systems

Outlook of Indian Household Energy and Emission Profile
S.K. Yawale 265

Estimation of Energy and Carbon Saving Potential in Industrial Lighting System
P. Ganesan, S. Rajakarunakaran, M. Thirugnanasambandam and D. Devaraj 272

Comparison Studies on Microwave & Muffle Furnace Heat Treatment for Al-B_4C Composite
K. Rajkumar, J.M.A. Charles, K.V. Kumar, J.J.C. Praveen and A. Padmanathan 280

Chapter 4: Improving the Efficiency of Power Systems

Comparison of Constant Instantaneous Power Control & Synchronous Rotating Frame Strategy for Total Harmonic Reduction in Aircraft System (400Hz)
S. Khalid, A. Tripathi and V.M. Mishra 287

Uncertainty Modelled Power Flow Analysis for DG Sourced Power Systems
P. Sivakumar and D. Poornima 298

Mitigation of Power Quality Problems Using DSTATCOM with Reduced DC Link Voltage
T.L. Saranya, G. Ezhilarasan and S.S. Dash 301

Nonlinear Unbalanced Load Compensation for PV Sourced Grid Connected Inverter
P. Sivakumar and M. Jeevitha 308

Analysis and Stability Enhancement of DG Sourced Power System with Modified AVR and PSS
P. Sivakumar and C. Birindha 313

Harmonic and Power Factor Analysis with Reactor and Capacitor in Adjustable Speed Drive
M. Srinivasan, S.U. Praba and R. Suganthi 317

Optimization Techniques for the Economic Dispatch Problem in Various Generation Plant
K. Thenmalar and A. Allirani 323

Mitigation of Power Quality Issues by Adaptive Current Hysteresis Band Controller Based Shunt Active Filter
N. Chellammal, V. Velmurugan, S.S. Dash and R. Abirami 329

Synthesis and Characterization of PANI/Ferric Chloride Composite for Fabrication of Electrodes in Supercapacitor
D. Sivalingam, H. Elangovan, M. Subramanian, S.K. Kandasamy and M. Govindasamy 334

Mitigation of Voltage Sags and Swells by Dynamic Voltage Restorer
S.P. Mishra, L. Varghese, J.P. Roselyn and D. Devaraj 338

A Novel Control Strategy for DVR to Improve Voltage Profile in Wind Farm
M.N. Himaja, S. Premalatha, S.S. Dash and P.C. Babu 344

Reliability Improvement in a Radial Distribution System Using DG
S.K. Singh, D. Sattianadan and M. Sudhakaran 351

Speed Control of Induction Motor via Pic Controller Using Lab View
L. Venkatesan, A.D. Janarthanan, P.R. Aarthi and R. Arulmozhiyal 359

Optimum Allocation of Distributed Generation Based on Nodal Pricing for Profit and Social Welfare Maximization
B. Biswal, D. Sattianadan, M. Sudhakaran and S.S. Dash 364

Maximum Loss Reduction and Voltage Profile Improvement with Placement of Hybrid Solar-Wind System
E. Rekha, D. Sattianadan and M. Sudhakaran 371

Transient Stability Improvement with Unified Power Flow Controller Using Fuzzy Logic and ANFIS Approach
S. Latha and C.K. Rani 378

Analysis of Full Bridge Series Parallel Resonant Converter for Battery Chargers
M.S. Rani, J. Samantaray and S.S. Dash 388

Stability Improvement in Power Systems Using Unified Power Flow Controller (UPFC)
B. Gopinath, S.S. Kumar and J. Michael 392

Three Input DC-DC Boost Converter for Hybrid Power System with Multilevel Inverter
J. Narayan and R.J. Uthayakumar 398

Design and Simulation of Energy Efficient Fixed Frequency Pulse Controlled Power Converter for Induction Melting Application
N. Booma, S.R. Reddy and M. Beryl 404