

Table of Contents

Preface, Organizing Committee and Sponsors

Chapter 1: Renewable Energy, Environment and Heat Transfer

Fabrication of Core-Shell Structured TiO₂/MgO Electrodes for Dye-Sensitized Solar Cells S. Karuppuchamy and C. Brundha	3
RETRACTED: Feasibility Study on Wave Energy Conversion by a Modified Oscillating Water Column Device V.P. Mohandas, R. Wilbert, S.S. Saji and L. Lukose	8
Effect of Circular Fins on Latent Heat Storage to Enhance Solar Water Heater, an Experimental Study G. Murali and K. Mayilsamy	13
Design and Fabrication of Riot Shield from E-Waste Printed Circuit Board A.G. Ganesh Kumar, G. Ranganath, S.N. Mani Varmaa, S.S.H. Jose and M. Sakthivel	18
Asymmetrical Solar still Coupled with the Mini Solar Pond: Performance Evaluation on Clear, Partially Cloudy and Cloudy Days P. Malaiyappan and N. Elumalai	22
Performance of Latent Heat Solar Thermal Energy Storage System Using Various Heat Transfer Fluids M. Gajendiran, P.M. Sivaram and N. Nallusamy	27
Experimental Analysis of Newly Designed Solar Assisted Single Effect Absorption Cooling System of 5.25 kW Cooling Capacity for Domestic Use V.B. Raja and V. Shanmugam	32
A Review of Latent Heat Thermal Energy Storage Systems G. Murali, K. Mayilsamy and B.M. Ali	37
Effect of Heat Capacity of Basin Material and Glass Cover on Distillate Yield of Single Slope Passive Solar still – A Theoretical Investigation V. Sivakumar, E. Ganapathy Sundaram, B. Sakthikiran, T. Sanjay Krishnan and A. Riyaz Hussain	43
Ramification of Mechanical Equipments in Abatement of Pollution – A Case Study in a Petrochemical Industry T.T. Philip, S.A. Nanda, C.R. Praveen Raj and V. Nagarajan	48
Numerical Investigation of Mass Flow Distribution in Wavy Microchannel Heat Sink M. Satheeshkumar, M.R. Thansekhar and C. Anbu Meenakshi	52
Performance Evaluation of Photovoltaic System in Humid Atmosphere D. Avithi Desappan, E. Natarajan and L. Ponnusamy	57
Numerical Studies on Convergent Tube-in-Tube Heat Exchanger M.A. Thangaswami, S.R. Arjun, M.K. Easwar and M. Suresh	62
Experimental Studies on Thermal and Catalytic Slow Pyrolysis of Groundnut Shell to Pyrolytic Oil R.M. Alagu and E. Ganapathy Sundaram	67
Performance Evaluation of Tube-in-Tube Heat Exchanger Using Nanofluids V. Naveen Prabhu and M. Suresh	72
Preperation and Characterization Study of Phase Change Materials for Thermal Energy Storage Applications P. Bhagyalakshmi, K. Rajan and K. Senthil Kumar	77
Experimental Study of Exergy Analysis on Flat Plate Solar Photovoltaic Thermal (PV/T) Hybrid System B. Srimanickam, M.M. Vijayalakshmi and E. Natarajan	82
Comparative Studies of PCM Based TES System Using Different PCMs R. Meenakshi Reddy, K. Krishna Reddy, E. Siva Reddy and T. Hariprasad	88
Black Silicon for Higher Efficiency in Solar Cells D. Raghunathan	92

Investigation of Biogas Production Using Organic Kitchen Wastes through Anaerobic Digestion	97
D. Thamilselvan, K. Arulkumar and M. Kannan	
Experimental and Computational Fluid Dynamics (CFD) Study of Glazed Three Dimensional PV/T Solar Panel with Air Cooling	102
R. Senthil Kumar, N. Puja Priyadarshini and E. Natarajan	
Experimental Analysis of a Solar still with Reflectors and Sensible Heat Storage Mediums	107
P. Prakash and V. Velmurugan	
Heat and Fluid Flow Characteristics of Copper Metal Foam as Heat Pipe Wick Material	112
D. Somasundaram, A. Mani and M. Kamaraj	
Thermodynamic Analysis of R134a-R23 Cascade Refrigeration System	117
P.L. Rupesh, J.M. Babu and R. Mariappan	
Solid Waste Management of Fishery and Shrimp	124
S. Kumari, P. Rath and A. Sri Hari Kumar	
Review on Performance Enhancement Studies on Solar Dryer	129
A.S. Ramana, T.V. Ashokumaar and K. Vignesh	
Methods for Improving Lift Force of Wind Turbine Aerofoil Blades during Low Wind Speed Conditions – A Review	134
S.P.R. Febi Ponwin and S. Rajkumar	
An Approach for Real Time Plastic Waste Segregation	138
R.P. Subin, S. Jeyanthi and S. Rajesh	
Development of an Efficient Procedure for Sustainable Low Carbon Cement Manufacturing Process	142
S.T. Chopperla, R. Jupalli, D. Kanraj, A. Bahurudeen, M.K. Haneefa and M. Santhanam	
Experimental Investigation and Theoretical Modelling of Solar Dryer Using Evacuated Tube Collector	147
R. Manivel, S. Sivakumar and T. Rajagopal	
Numerical Heat Transfer and Pressure Drop Studies of Turbulent Al₂O₃ - Ethylene Glycol/Water Nanofluid Flow in an Automotive Radiator Tube	152
N. Mohanrajhu, K. Purushothaman and N. Kulasekharan	
Theoretical Performance Analysis of Solar Chimney Power Plant for Kota Region of Rajasthan, India	157
Z. Akhtar and K.V.S. Rao	
Proliferation of Population and Pollutants-Pathway for a Grave Future: Comparison of Past and Present Indian Scenario – A Review	162
S. Shevarjun, P. Radika and R. Senthil	
Evaluation of Common Herbs for Treating Soak Liquor of Tannery	167
K. Lakshmi, K. Yamuna and V.S. Gayathri	
CFD Analysis of Heat Transfer Characteristics of Helical Coil Heat Exchangers	172
R. Maradona and S. Rajkumar	
Numerical Investigations of Outward Solidification in Cylindrical PCM Storage Unit	177
V. Antony Aroul Raj, C. Hariharan, R. Velraj and R.V. Seeniraj	
The Effect of Cotton Cloths on the Performance of the Solar still	182
T.G. Sakthivel, S. Senthil Kumar and A. T V	
Carbon Footprint Analysis of an Educational Institution	187
P.M. Sivaram, N. Gowdhaman, D.Y. Ebin Davis and M. Subramanian	
Experimental Study on Thermal Efficiency of Parabolic Trough Collector (PTC) Using Al₂O₃/H₂O Nanofluid	192
E. Siva Reddy, R. Meenakshi Reddy and K. Krishna Reddy	
Thermal Performance of Solar Parabolic Dish Concentrator with Hetero-Conical Cavity Receiver	197
V. Thirunavukkarasu and M. Cheralathan	
Performance Investigation of an Eco-Friendly Refrigerant Mixture as an Alternative to R290/R600a	202
M. Karthick and K. Senthil Kumar	
Colburn 'j' Factor and Fanning Friction Factor 'f' Correlations of Triangular Plain Fin Surface of a Compact Heat Exchanger Using CFD	207
R. Bala Sundar Rao, G. Ranganath and C. Ranganayakulu	

Experimental Investigation of Heat Transfer Performance of Different Nanofluids Using Automobile Radiator	
S. Senthilraja, K.C.K. Vijayakumar and R. Gangadevi	212
Wind Turbine Aerodynamic Braking System Analysis Using Chord Wise Spacing	
B. Navin Kumar and K.M. Parammasivam	217
Numerical Investigation of a Chevron Type Brazed Plate Heat Exchanger	
N. Manigandan and M. Suresh	222
Maximum Power Point Tracking (MPPT) for a Solar Photovoltaic System: A Review	
L.A. Arun Shravan and D. Ebenezer	227
Comparative Study on Commercial and Corn Cobs Activated Carbon for Removal of Congo Red Dye	
K.R. Leelavathy, V. Nageshwaran and M. Bharathi	233
Improving the Boiler Efficiency by Optimizing the Combustion Air	
R. Pachaiyappan and J. Dasa Prakash	238

Chapter 2: Modeling and Simulation

Numerical Studies on the Effect of Cambered Airfoil Blades on Self-Starting of Vertical Axis Wind Turbine Part 2: NACA 0018 and NACA 63415	
S. Seralathan, T. Micha Premkumar, S. Thangavel and G.P. Pradeep	245
Numerical Studies on the Effect of Cambered Airfoil Blades on Self-Starting of Vertical Axis Wind Turbine Part 1: NACA 0012 and NACA 4415	
T. Micha Premkumar, S. Seralathan, T. Mohan and N.N.P. Saran Reddy	250
Modeling and Simulation of Industrial Coal Fired Boiler	
S. Vijayalakshmi, D. Manamalli and S. Ramesh Babu	255
Optimization of Tool Wear Rate during Electro Discharge Machining of NiTi Alloys Using Taguchi Method	
V.S. Jatti and T.P. Singh	260
Fuzzy Based Optimization of Thrust Force and Torque during Drilling of Natural Hybrid Composites	
R. Vinayagamoorthy, N. Rajeswari, S. Sivanarasimha and K. Balasubramanian	265
Finite Element Modelling and Simulation of Train Car Body Structure Using LS-Dyna®	
S. Deepak, A. Vasanthanathan and P. Nagaraj	270
Finite Element Studies on Lattice Conical Shell Structures Using LS-Dyna®	
L. Vigneshwara Mahaprabhu, A. Vasanthanathan and P. Nagaraj	275
CFD Analysis of a Solar Parabolic Dish	
C. Uma Maheswari and R. Meenakshi Reddy	280
Particle Swarm Optimization for Integrated Fixture Layout	
D. Elilraja and S. Vijayan	285
Numerical Simulation on Effect of Impact Velocity and Target Thickness in Magnesium Alloy AZ31B	
B. Ezhil Vendhan, K.L. Harikrishna and A.K. Lakshminarayanan	291
Performance Analysis of Thin Shell Bends under High Pressure and Temperature	
P. Govindaraj and M. Senthilkumar	296
Thermal Analysis of Two Wheeler Brake Disc Using ANSYS	
V. Ganesh and T. Abinaya	301
Simulation of a Motorcycle Motion during Braking at Cornering Using MATLAB	
V. Ganesh and S.P. Chidambaram	306
Theoretical Modelling of Silica Gel Desiccant Wheels	
R. Narayanan	311
Effect of Swirl on the Performance of an Annular Diffuser	
R. Prakash, V.K. Srinivas, H. Anand, G. Adithya and N. Lakshmi Narayanan	318
A Fuzzy Inference System for Water Quality of Chunnambar River, Puducherry	
V. Nirmala, K.R. Leelavathy, S. Sowndharya and P. Bama	322
Theoretical Model for the Optimal Design of Surface Texturing on Piston Compression Ring	
S. Prakash and G. Nagarajan	327

Chapter 3: Materials Properties Research and Processing

Generation of Crack Growth Resistance Curve from ENF Specimens Made of Glass/Epoxy: An Experimental Study

V. Alfred Franklin and T. Christopher 335

Development of an In-House Test for Nut Integrity in F-Type Wheels

V.E. Annamalai, A. Hariharan, S.K. Vigneshram, C. Vinoth Kumar, V. Ananthakrishnan and A.X. Kennedy 340

Energy Enhancement of Long Cylindrical Tubes with Grooves Subjected to Axial Impact

M. Nalla Mohamed, P. Yuvarajan and M. Umasankar 345

Microstructure and Mechanical Properties of Friction Stir Welded Joints of Dissimilar AA6061-T6 and AA7075-T6 Aluminium Alloys

V. Saravanan, N. Banerjee, R. Amuthakkannan and S. Rajakumar 350

Fatigue Behaviour of Friction Stir Welded AZ31B Magnesium Alloy Joints

S. Venkatesan, G.P. Rajamani, V. Balasubramanian and G. Padmanaban 355

Experimental Investigation of Machining Parameters during Turning of AISI 316L

Stainless Steel Using Nano Cutting Environment
T. Rajmohan, S.D. Sathishkumar and K. Palanikumar 361

Electric Discharge Machining of Cryo-Treated NiTi Alloys

V. Gaikwad, V.S. Jatti and T.P. Singh 366

Magnetic Field Assisted Electric Discharge Machining of Cryo-Treated Monel 400 Alloy

R.R. Jadhav, V.S. Jatti and T.P. Singh 371

Machinability Study of Beryllium Copper by Powder Mixed Electric Discharge Machining

S. Bagane, V.S. Jatti and T.P. Singh 376

An Assessment on Mechanical and Microstructural Properties of Friction Stir Welded 316 L Austenitic Stainless Steel

S. Shashi Kumar, N. Murugan and K.K. Ramachandran 381

Electric Discharge Machining of Cryo-Treated BeCu Alloys

S. Chinke, V.S. Jatti and T.P. Singh 386

Improvement of Wear Performance of High Speed Steel Tool Using Physical Vapour Deposition Coating Process

R.R.R. Malarvannan, T.V. Moorthy and S. Ravi 391

Optimum Welding Conditions for Dissimilar Spot Friction Joining of Aluminium - Interstitial Free Steel Joints

R. Archish, A.K. Lakshminarayanan and V.E. Annamalai 396

Role of Induction Preheating on Tool Wear and Properties of Friction Stir Welded 409M Stainless Steel Joints

V.G. Vijay Prakaash, A. Vignesh, A.K. Lakshminarayanan and V. Balasubramanian 401

Nano Graphite Powder Assisted Electric Discharge Machining Characteristics of ZM21 Magnesium Alloy

S. Santosh, S. Javed Syed Ibrahim, P. Saravanamuthukumar, K. Rajkumar and K.L. Harikrishna 406

Understanding the Parameters Controlling the Resistance Spot Welding of DP980 Steel

G. Manimaran, A.K. Lakshminarayanan and S. Balaji 411

Experimental Investigation and Performance Characteristics Study of Electrolyte in Micro Electrochemical Machining

J. Prakash and S. Gopalakannan 416

Improving Wear Resistance of AISI 316LN Austenitic Stainless Steel Using Friction Stir Processing

A. Vignesh, V.G. Vijay Prakaash and A.K. Lakshminarayanan 421

Corrosion Resistance of Friction Stir Processed AZ91D Magnesium Alloy under a Salt Fog Environment

J.C. Jolly, V.K. Srinivas and A.K. Lakshminarayanan 426

Investigation of Thrust Forces, Torque and Chip Microstructure during Drilling of Ti-6Al-4V Titanium Alloy

K. Sushinder, P.R. Shivaram, S.B. Nivedh Kannaa, N. Gupta and K.S.V. Sekar 431

Determination of Material Parameters during Superplastic Forming of AZ31B Magnesium Alloy at Elevated Temperatures in Uniaxial Tensile Test

S.R. Babu, V. Shah and M.P. Shyam 437

Assessment of Microstructure and Wear Resistance of Friction Stir Processed Cast Mg-Al-Zn Magnesium Alloy	
R. Jayaraman, T. Balusamy and A.K. Lakshminarayanan	442
Experimental Study on the Machinability of Inconel 718 Alloy Using Coated Carbide Tool	
M. Manohar, K. Jayakumar, R.M. Cherian and K.M. George	448
Dry Sliding Wear Behavior of Ni-Cr/Micro-ZrO₂ Coated AISI 410 Grade Steel-Final Revision	
K.G. Girisha, R. Rakesh, K.C. Anil and K.V. Sreenivas Rao	454
A Parametric Optimization on Cutting Force during Laser Assisted Machining of Inconel 718 Alloy	
M. Vignesh, K. Venkatesan, R. Ramanujam and P. Kuppan	460
An Experimental Study on Machinability of Micro Alloyed Steel with K20 Single Layer (TiN) Coated Carbide Insert	
S. Muniraj and N. Muthukrishnan	465
Microstructure and Tensile Properties of Friction Stir and Gas Tungsten Arc Welded AZ91D Magnesium Alloy Joints	
A. Shanmugasundaram, A.K. Lakshminarayanan and V.E. Annamalai	470
Studies on Microstructure and Mechanical Properties of GTAW, Laser and Friction Stir Welded ZM21 Magnesium Alloy	
K.L. Harikrishna, S.R. Koteswara Rao and V.V.S. Rao	475
Machinability Studies in Drilling of Inconel 718 Super Alloy	
M. Vimallesh, S. Prabhu and K.S.V. Sekar	480
Zone Wise Properties of Friction Stir Welded Copper – Stainless Steel Joints Using Digital Image Correlation	
K. Srinivas, R. Saranarayanan, A.K. Lakshminarayanan, N. Srinivasan and B. Venkatraman	485
Influence of Cooling Rate on Fatigue Behaviour of Eutectic Al-Si (A413) Alloy Casting	
M. Mohandass, J. Venkatesan and N. Nallusamy	490
Effect of Diffusion Bonding Temperature on Mechanical and Microstructure Characteristics of Cp Titanium and High Strength Aluminium Dissimilar Joints	
K. Dheenadayalan, S. Rajakumar and V. Balasubramanian	495
Identification of Optimized Welding Conditions for Pulsed Current Gas Metal Arc Welding of AISI 904 Super Austenitic Stainless Steel	
P. Manavalan, S. Ravi and R. Kesavan	500
Thermal Performance Evaluation of Friction Stir Welded Flat Plate Heat Sink Using CFD Analysis	
A.K. Lakshminarayanan and M. Suresh	505

Chapter 4: Composite Materials Characterization

Processing Techniques of a Silicon Carbide Heat Exchanger and its Capable Properties – A Review	
R. Pachaiyappan, R. Gopinath and S. Gopalakannan	513
Characterization of Glass Fibre/Carbon Fibre Hybrid Thermoplastics Composite Laminates Fabricated by Film Stacking Method	
M. Mudhukrishnan, P. Hariharan and S.K. Malhotra	518
Abrasive Assisted Electrochemical Machining of Al-B₄C Nanocomposite	
K. Rajkumar, L. Poovazhgan, P. Saravanamuthukumar, S. Javed Syed Ibrahim and S. Santosh	523
Comparative Study of Wear Behavior of Multilayer Coatings for Human Hip Prosthesis	
M. Kalayarasan, V. Prabhu Raja, V. Nithin, S. Vivinkumar and M. Vishwaanth	528
Development and Property Evaluation of Fiber Reinforced Hybrid Epoxy Laminate Composite: Jute/E-Glass/Carbon-Fabric-Final Revision	
B. Adaveesh, K.C. Anil, M. Vishwas and R.P. Archana	534
Preparation and Characterization of Al 64430 Metal Matrix Reinforced with SiC Particles	
T. Gupta, R. Chaudhary and V.S. Jatti	538
Effect of Cyclic Loading Frequency on Flexural Modulus of GFRP Laminates with Resin Rich Intermediate Layers	
T.G. Loganathan, R. Krishna Murthy and C. Kesavan	543

Role of Two Stage Wet Layup Manufacturing Method to Fabricate and Test Chemically Treated Dora Hemp Particulate FRP Composites N. Srinivasababu and D. Avinash	548
Effect of Magnesium Addition on Processing the Al-0.8 Mg-0.7 Si/SiC_p Metal Matrix Composites L. Poovazhagan, K. Rajkumar, P. Saravanamuthukumar, S. Javed Syed Ibrahim and S. Santhosh	553
Upshot of Ultrasonic Amplitude on Developing the AA6061/SiC Metal Matrix Nanocomposites L. Poovazhagan, K. Kani, V.R. Balaji, P. Haripriya and S.C. Amith	558
Conductivity Studies on Nano ZnO Incorporated PVC-PVdF Gel Electrolytes for Li⁺ Ion Battery Application D. Ravindran, P. Vickraman and N. Sankarasubramanian	563
An Investigation of Mechanical Properties on Aluminium 6061 Reinforced with Silicon Carbide - Metal Matrix Composites A. Radha and K.R. Vijaya Kumar	568
Studies of Abrasive Water Jet Machining (AWJM) Parameters on Banana/Polyester Composites Using Robust Design Concept S. Kalirasu, N. Rajini, N. Bharath Sagar, D. Mahesh Kumar and A. Gomathi Sankar	573
Development and Mechanical Testing of Filament Wound FRP Composite Components M. Kannan, K. Kani and T. Sornakumar	578
Study on Mechanical Properties of AA6351 Alloy Reinforced with Titanium Di-Boride (TiB₂) Composite by <i>In Situ</i> Casting Method V. Mohanavel, K. Rajan and K.R. Senthil Kumar	583
Investigation on Physical, Mechanical and Wear Properties of SiC Particulate Reinforced Aluminium Metal Matrix Composite R. Ganesh, J. Saranesh Kumar, R. Satya Prakash and K. Chandrasekaran	588
Mechanical Properties of Copper-TiC <i>In Situ</i> Metal Matrix Composite S. Harish and R. Keshavamurthy	593
Mechanical Characteristics of Hot Forged Al6061-Al₂O₃ Composite K.V. Shivananda Murthy, R. Keshavamurthy and D.P. Girish	598
Performance Analysis of Composite Leaf Spring Using Computer Aided Engineering S. Melvin Savio, D. Somasundaram and V. Vijaya Rajan	602
Development of Rice Husk and Wood Dust Filler Based Polyester Resin Based Composites D. Ravindran, T. Sornakumar, P. Sankar and K. Janarthan	607
Effect of Nano Aluminum Oxide Fillers on the Properties of FRP Polymer Matrix Composites G. Seshanandan, D. Ravindran and T. Sornakumar	612
Effects of Micro and Nano-Size Al₂O₃ Particle Reinforcement on Mechanical Behaviour of Extruded Aluminum Alloy Matrix Composite R. Senthilkumar, N. Arunkumar and M.H. Mohammed	617
<i>Ex Situ</i> Development of Y-Ti-O Nano Clusters B. Anandan and S. Gopalakannan	622
Wear Mitigation in Cast Magnesium Alloy through Flyash Reinforced Friction Stir Surface Compositing K. Maniraj and A.K. Lakshminarayanan	627
Effect of Fibre Volume Fraction on Mechanical Properties of FRTP Laminates Produced by Film Stacking Method R. Parvatham, K. Chandrasekaran and S.K. Malhotra	632
Experimental Analysis and Forecasting of Material Removal Rate and Cutting Force in End Milling on A356 Alloy-SiC Metal Matrix Composites K. Jayakumar, J. Mathew and M.A. Joseph	637
Tool Wear Analysis of Al 6061 Reinforced with 10 wt% Al₂O₃ Using High Hardened Inserts M. Vignesh, K. Venkatesan, R. Ramanujam and S. Vijayan	643
Influence of Particle Feeding Methods on Processing the AA6061/SiC Metal Matrix Nanocomposites L. Poovazhgan, S.C. Amith, A. Kali Avudaiappan and P. Haripriya	648
Tribological Characteristics of Al6061-TiC Composite Synthesized by <i>In Situ</i> Technique G.S. Pradeep Kumar, R. Keshavamurthy, C.S. Ramesh and B.H. Channabasappa	653

Effects of Red Mud Reinforcement on Hardness, Wear Behaviour of Cast Al-6Si-0.45 Mg Alloy	
B. Geetha and K. Ganesan	658
Impact of Tool Inserts in High Speed Machining of GFRP Composite Material	
K. Anand, M.V. Siddharth, K.S.V. Sekar and S. Suresh Kumar	664
Friction Stir Welding of the Aluminum Matrix Composite - A Literature Review	
K. Reddi Prasad and A. Mahamani	669

Chapter 5: Engines and Alternative Fuels

Experimental Analysis of Different Packed Bed Catalysts for Lean NO_x Traps (LNT)	
P. Kumaran, S. Mohanamurugan, P. Shankar, R. Vijay and R. Narayanan	677
Spray Characteristics of Diesel and Biodiesel Fuels for Various Injection Timings under Non Evaporating Conditions	
P. Raghu, N. Nallusamy and P. Kasivisvanathan	682
Experimental Studies on the Performance of C.I Engine with Fish Oil Methyl Ester as Fuel for Various Blends of Diesel and LPG	
T. Hari Prasad, R. Meenakshi Reddy and P. Mallikarjuna Rao	687
Performance and Emission Evaluation of a Compression Ignition Engine Using Agitated Diesel Fuel	
B. Jayakishan, R. Prakash, K. Kumarrathinam and D. Christopher	692
Experimental Investigation of Diesel - Hydrogen Dual Fuel Direct Injection C.I. Engine with Exhaust Gas Recirculation	
R. Senthil Kumar and M. Loganathan	697
Influence of Engine Speed on Mixing and Emission Characteristics of Multiple-Injection Common Rail Direct Injection Diesel Engine	
S. Rajkumar and G. Sudarshan	702
Zero-Dimensional Analysis of Combustion in a Multiple-Injection CRDI Engine Using Wiebe Law	
G. Sudarshan and S. Rajkumar	707
Experimental Study on NO_x Reduction in CI Engine Fuelled with Biodiesel (Cotton Seed Methyl Ester Blends) Using Selective Catalytic Reduction (SCR) System with Anova Analysis	
M. Kowshik Dhev, R. Sheshathri, A. Avinash and S. Natarajan	712
Experimental Evaluation of Compression Ignition Engine Fueled with Cashew Nut Shell Liquid Diesel Blend with the Effect of Various Injection Pressures	
S. Krishnamoorthy, K. Rajan, K.R. Senthil Kumar and M. Prabhahar	717
Effect of Re-Entrant and Toroidal Combustion Chambers in a DIC Engine	
S. Arumugam, P. Kasivisvanathan, M. Arvenanth and P. Maheshkumar	722
Analysis of Lift off Height and Blow-Off Mechanism of Turbulent Flame by V-Gutter Bluff Body	
B. S, P. Maran, V. Caleb Eugene and S. Prabhu	727
Innovative Passive Flame Ameliorator for a Diffusion Flame Burner Using Chevrons	
A. Alaguraja, S. Balaji, I. Sandeep, M. Karthikeyan and S. Somasundaram	732
Influence of Ethanol and Di-Ethyl Ether Addition on Fuel Properties of Sunflower Oil Methyl Ester	
P. Maran and K. Arumugam	736
Experimental Investigation on the Performance and Emission Characteristics of Di-Diesel Engine Using Diesel-Ethanol Blends with Aqueous Cerium Oxide Nanofluid as Additive	
P. Ravichandra Ganesh and K.H. Reddy	741
Performance and Emission Characteristics of a Di Diesel Engine Fuelled with Cashew Nut Shell Oil (CNSO)-Diesel Blends with Diethyl Ether as Additive	
A. Kumar, K. Rajan, M. Rajaram Naraynan and K.R. Senthil Kumar	746
Performance and Emission Test of Different Mixtures of Oils with Diesel Using Twin Cylinder Four Stroke Diesel Engine	
P. Vithya and V. Logesh	751
Effect of Ethanol on the Fuel Consumption of a Two Stroke Unmodified Commercial Petrol Engine	
A. Kirthivasan, J. Amitesh Jain, A. Ramesh and D. Ebenezer	756

Performance Study of Preheated Mustard Oil Methyl Ester on Naturally Aspirated CI Engine	761
M. Venkata Ramanan and D. Yuvarajan	
Effect of Saturation and Unsaturation of Fatty Methyl Esters on Biodiesel NOx Emission Characteristics	766
J. Thangaraja and S. Rajkumar	
Analysis of Bio-Oil Produced by Co-Pyrolysis of Mahua Seed and Polystyrene	771
D. Pradhan and R.K. Singh	
A Review on Microalgae Biodiesel Production and its Usage in Direct Injection Diesel Engines as Alternate Fuel	776
V. Venkatesan and N. Nallusamy	
Analysis of Surface Waste Heat Recovery in IC Engine by Using TEG	782
R. Prakash, D. Christopher and K. Kumarrathinam	
Comparative Analysis of Performance and Emission Characteristics of Diesel Engine with Biodiesel Prepared from Waste Cooking Oil and Pongamia Oil	787
R. Prakash, K. Adithyan and V. Adithya	
Improved Efficiency in Engine Cooling System by Repositioning of Turbo Inter Cooler	792
F. Justin Dhiraviam, V. Naveen Prabhu, T. Suresh and C. Selva Senthil Prabhu	
Performance and Emission Studies of Biodiesel Fuelled Diesel Engines: A Review	797
P. Tamilselvan, K. Vignesh and N. Nallusamy	
Production of Bio Gas from Vegetable and Flowers Wastes Using Anaerobic Digestion	803
A. Deepanraj, S. Vijayalakshmi and J. Ranjitha	
Extraction and Characterization of Oil from the Seeds of Jatropha Curcas Using Supercritical CO₂ and Soxhlet Extraction Process	809
P. Rastogi, R. Jambulingam, S. Vijayalakshmi and M.S. Donatus	
Effect of Various Injection Pressures on Spray Characteristics of Karanja Oil Methyl Ester (KOME) and Diesel in a DI Diesel Engine	815
V. Prakash, B.P. Ramanujam, C.S. Nivedan, N. Nallusamy and P. Raghu	

Chapter 6: Electrical Energy Systems and Devices

Bi-Directional Z-Source Inverter for Superconducting Magnetic Energy Storage Systems	823
U. Shajith Ali	
A Modified Maximum Power Point Tracking Control for Bi-Directional Z-Source DC-DC Converter Based Solar Electric Vehicle	828
U. Shajith Ali	
A Novel Control Scheme for Power Factor Improvement in Modified Bridgeless Boost Converter	833
T. Annamalai and V. Rajini	
Analysis of Controllers for Photovoltaic Fed Brushless DC Motor Based Water Pumping System	838
M. Pandikumar, R. Ramaprabha and R. Muthu	
Energy Optimization of Solar Micro-Grid Using Multi Agent Reinforcement Learning	843
L. Raju, R.S. Milton and S. Sakthiyanandan	
Control of Industrial Drives through Multicell Impedance Source Inverter	848
V. Raghavendra Rajan, C.S. Ajin Sekhar, B. Arun Kumaran and M. Sasikumar	
Switched Reluctance Motor Actuator Based on Current Source Converter for Automotive Throttle Control	854
A. Vivek and R. Kalpathi	
Improvement in Energy Harvest of Solar Photovoltaic Systems under Partial Shaded Conditions	859
S. Malathy and R. Ramaprabha	
Comparison of DC-DC Converters for Photo-Voltaic Application	864
M. Chilambarasan, M. Ramesh Babu and T. Jones Basil	
Step by Step Design of Flux Switching Machine Using Electromagnetic Principle	869
P. Ramesh, R. Gokulakrishnan, N. Sathyanarayanan, R. Hemantha Kumar and N.C. Lenin	
A Novel Skewed Linear Switched Reluctance Motor – Analysis and Design	874
V. Ganesh Sampath, R. Elavarasan, N.C. Lenin and R. Arumugam	

Design and Experimental Verification of Linear Switched Reluctance Motor with Tapered Poles	
V. Ganesh Sampath, R. Elavarasan, N.C. Lenin and R. Arumugam	878
Regeneration Using C-Dump Fed Switched Reluctance Generator	
F. Jensen and R. Kalpathi	883
Design and Implementation of Perturb and Observe (P&O) MPPT Technique for Negative Output Super-Lift Luo Converter	
P. Dhivya, V. Chamundeeswari and R. Seyezhai	888
A Fuzzy Logic Controlled Single Axis Solar Tracking System	
S. Racharla, K. Rajan and K.R. Senthil Kumar	893

Chapter 7: Measurements and Testing

Damage Detection in Laminated Composite Beams, Plates and Shells Using Dynamic Analysis	
G. Mahendran, C. Kesavan and S.K. Malhotra	901
On-Line Monitoring the Hard Turning Using Distribution Parameters of Acoustic Emission Signal	
J. Bhaskaran	907
Flaw Quantification in Colmonoy Overlays Using Immersion Ultrasonic Testing	
S. Santhosh, K. Rajkumar, M. Menaka and B. Venkataraman	912
Design of a Vision Based Bottle Cap Inspection System	
C. Arun Prakash, C.S. Saileshwar, R. Rajkumar and S. Subash	917
Image Processing Techniques to Analyse a 3D Model	
M.S. Gururaj and A. Arockia Selvakumar	922
Fault Diagnosis of Centrifugal Pump and Vibration Control Using Shape Memory Alloy Based ATDVA	
M. Senthilkumar, M. Yuvaraja and M. Kok	927
Design and Analysis of Micro Accelerometer for Tool Condition Monitoring	
K. Gomathi, A. Senthil Kumar and M. Raghunath	932