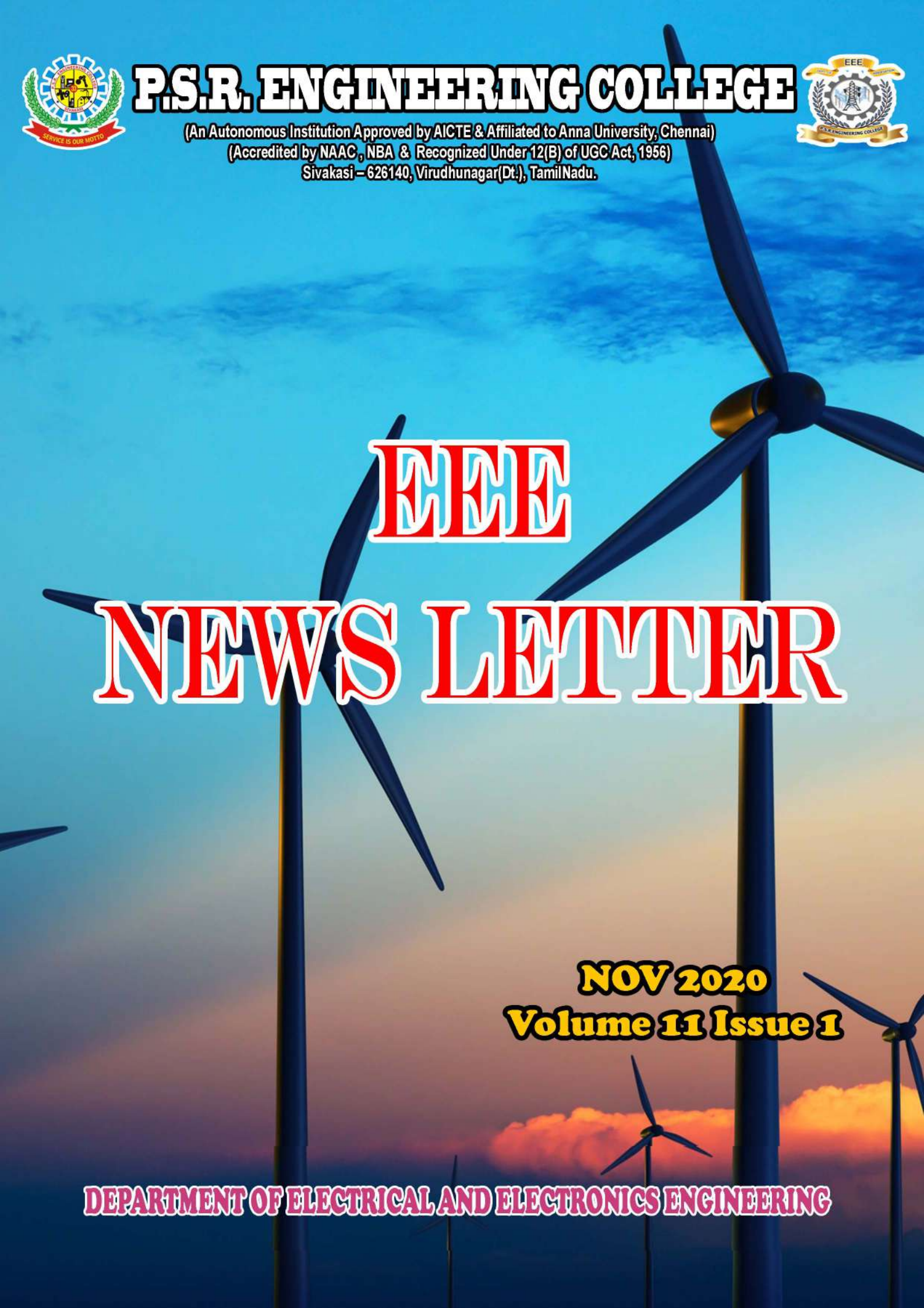
P.S.R. ENGINEERING COLLEGE

(An Autonomous Institution Approved by AICTE & Affiliated to Anna University, Chennai)
(Accredited by NAAC , NBA & Recognized Under 12(B) of UGC Act, 1956)
Sivakasi – 626140, Virudhunagar(Dt.), Tamil Nadu.



EEE NEWS LETTER

NOV 2020
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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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FACULTY ACTIVITIES

JOURNAL PUBLICATIONS

Name of the Faculty	Title of the paper	Journal Name	ISSN No	Volume, issue, page No	Scopus/ Web of Science	Impact Factor
Dr.R.Madavan	Optimization of Mineral Oil properties blended with Natural Ester Oils using Taguchi-based Grey Relational Analysis	Fuel	ISSN: 0016-2361	Vol.228	Web of Science	5.578
	Evaluating Critical Characteristics of Vegetable Oil as a Biodegradable Insulating Oil for Transformer	International Journal of Emerging Electric Power Systems	ISSN: 1553-779X	Vol.21, No.5, pp.1-9	Scopus	0.875
Dr.S.EdwinJose	Power quality disturbance analysis of BLDC motor drive using wavelet transform	AIP journal	ISSN:1551-7616	2207(1): 020001	Scopus	0.4
	Automatic and Real Time Classification of Power Quality Disturbance using Statistical Moments	AIP Journal	Accepted		Scopus	-
Dr.S.Anbarasi	An Optimal Tuning of Integral Controller for Hybrid LFC System Integrated with Wind Energy Resources	International Journal of Advanced Science and Technology	ISSN: 2005-4238	Vol. 29, No. 7s, pp. 1212-1221	Scopus	-
Mrs.R.Aruna	Modeling, system identification and design of fuzzy PID controller for discharge dynamics of metal hydride hydrogen storage bed	International journal of hydrogen energy(Elsecier-Science Direct)	ISSN 0360-3199	45,7	Web of Science	4.084

CONFERENCE PUBLICATIONS

Name of the Faculty	Title of the paper	Conference Name	College	Date
Dr.S.Edwin Jose	An efficient framework for locating stroke in brain MRI image using radon transform and convolution neural networks	Green Technologies for Power Generation,Communication and Health Care	St Peter' sInstitute of Higher Education and Research	06.06.2020
Dr.K.Punitha	Design and analysis of ardiuno controller for PV based cascaded buck-boost converter with water pump load	International conference on automation, signal processing and energy system (ICASE-2020)	Kalasalingam academy of research and education	19.06.2020, 20.06.2020
Dr.S.Anbarasi	An Optimal tuning of integral controller for Multi-source LFC system integrated with Solar energy Resources	Virtual International Conference on Power Initiatives (ICPI-2020)	K.Ramakrishnan College of Engineering	22.07.2020, 23.07.2020
	Smart Attendance System Using Fingerprint Sensor With SMS Notification	International conference on automation, signal processing and energy system (ICASE-2020)	Kalasalingam academy of research and education	19.06.2020, 20.06.2020
Mr.S.Sivakumar	An Optimal tuning of integral controller for Multi-source LFC system integrated with Solar energy Resources	Virtual International Conference on Power Initiatives (ICPI-2020)	K.Ramakrishnan College of Engineering	22.07.2020, 23.07.2020
Mr.M.Sivaraman	Performance analysis of high voltage insulator by using nano particles.	National Conference On Advances in Engineering, Management and Science 2020 Online Mode Organized by Santhiram Engineering College, AP.	Santhiram Engineering College, AP	June, 2020.

BOOK CHAPTER PUBLICATIONS

Name of the Faculty	Title of the chapter	Authors	Name of the Publisher	ISBN	Scopus/ Web of Science	Year of Publication
Dr.S.Anbarasi	Application of Artificial Intelligent Techniques in microgrid	S.Anbarasi, S.Ramesh, S.Sivakumar S. Manimaran	Wiley -Scrivener Publishing	9781119710790	Scopus	2020

COURSERA COURSES

Name of the Faculty	Title of the Course	Duration in weeks
Dr.Punitha K	Introduction to Big Data	9
	Evidence - based Toxicology	5
	Structuring Machine Learning Projects	5
	Introduction to International Criminal Law	8
	COVID-19 - what you need to know	2
	Electrical Industry Operations and markets	2
Dr.Anbarasi S	Speak English Professionally: In Person, Online & On the Phone	4
	Programming for Everybody (Getting Started with Python)	7
	Astro 101: Black Holes	10
	English for Teaching Purposes	4
	Introduction to Programming with MATLAB	9
	Motors and Motor Control Circuits	5
	International Water Law	5
	Introduction to International Criminal Law	8
	COVID-19 - A clinical update	2
	Modeling and Debugging embedded system	6
Mr.Sivakumar S	Electrodynamics: Electric and Magnetic Fields	5
	Industrial IOT Markets and Security	5
Mrs.Krishnaveni S	Astro 101 Block Holes	10
	Covid -19 A Clinical Update	2
	Energy Production and Distribution	4
	Industrial IOT and Market Security	5
	International Water Law	5
	Introduction to International Criminal Law	8
	Motors and Motor Control Circuits	5
	Pressure, Force, Motion and Humidity Sensors	5
	Structuring Machine Learning Projects	2
	Covid-19 What do you Need to Know(CME Eligible)	1
	Semiconductor Physics	4
Mrs.Aruna R	Semiconductor Physics	4

	Introduction to Programming with MATLAB	9
	Pressure, Force, Motion, and Humidity Sensors	5
	Astro 101: Black Holes	10
	COVID-19 - A clinical update	2
	Introduction to International Criminal Law	8
	International water law	5
	Motors and Motor control circuit	4
Mr.Ramaraj S	Introduction to Household Water Treatment and Safe Storage	5
	International Water Law	5
Mr.SarathChandran P	International Water Law	5
	Introduction to International Criminal Law	8
Ms.Mangaiyarkkarasi B	Introduction To International Criminal Law	8
Ms.Ajitha K	Introduction to the Internet of Things and Embedded Systems	4
	Introduction to International Criminal Law	8

WORKSHOPS/FDPS/SEMINARS

Name of the Faculty	Name of the workshop/FDP	Name of the Institute/Industry	Duration
Dr.R.Madavan	Artificial Intelligence, Machine Learning, IoT and Big data applications in Power Electronics and its Allied Areas	GokarajuRangaraju Institute of Engineering and Technology	01.06.2020 to 06.06.2020
	Microgrid Opportunity: Renewable Energy Resources and Buildings	Dayalbagh Educational Institute, Dayalbagh, Agra,	16.06.2020 to 20.06.2020
	Emerging Trends in Power and Energy Systems	Gautam Buddha University	24.08.2020 to 28.08.2020
Dr.K.Punitha	Technical Trends in IoT, Data Science & Artificial Intelligence	PSR Engineering College	02-11-2020 to 17-11-2020
	Recent Trends in Information Technology	CMS college of engg and Technology	03-06-2020 to 05-06-2020
	Intelligent Controllers For Renewable Energy Systems	P S R Engineering College	02-06-2020 to 03-06-2020
	Technological Advances in Power Switching Converters for Renewable Energy Sources and Fuel Cell Technology for E-vehicles	P S R Engineering College	01-06-2020 to 05-06-2020
	Deep Learning Networks and Applications	IEEE Madras section	26-08-2020 to 29-08-2020
	Tools for Scientific Communication and Effective Teaching	VAAGDEVI college of Engineering	02-06-2020 to 06-06-2020
Dr.S.Edwin Jose	Electric Vehicles	University College of Engineering Villupuram.	2020-11-30 to 2020-12-4
	Internet of Things (IoT)	SRM Institute Of Science And Technology	2020-12-7 to 2020-12-
	Artificial Intelligence, Machine Learning, Internet of Things & Big Data Analysis in Power Electronics and its allied Areas	GokarajuRangaraju Institute of Engineering and Technology Hyderabad	01.06.2020 to 06.06.2020
	Recent Trends in Electrical Engineering	Vishnu Institute of Technology	08.06.2020 to 12.06.2020
Dr.S.Anbarasi	Electric cars technologies and modern power system	Kamaraj college of Engineering and Technology	12-11-2020 to 17-11-2020
	Technical Trends in IoT, Data Science & Artificial Intelligence	PSR Engineering College	02-11-2020 to 17-11-2020
	Artificial Intelligence, machine Learning, internet of things & Big data applications in power electronics and its allied areas	GokarajuRangaraju Institute of Engineering and Technology	01.06.2020 to 06.06.2020

	Data Science and Machine Learning	Sri Krishna college of Technology	02.05.2020 to 04.05.2020
	Effective Usage of ICT tools for E- Content Preparation	JayarajAnnapackiam college for women	27.04.2020 to 02.05.2020
	Virtual Teaching Research Opportunities in Electrical Engineering and its Applications	Coimbaotre Institute of Technology	29.04.2020 to 30.04.2020
	Research Opportunities in Electrical Engineering and its Applications	P.S.R Engineering College	18.05.2020 to 23.05.2020
Mrs.S.Krishnaveni	Challenges and Opportunities in Electric Vehicle technologies Adoption -Series:01	Sri Krishna College of Technology	16.11.2020 to 21.11.2020
	Electric cars technologies and modern power system	Kamaraj college of Engineering and Technology	12-11-2020 to 17-11-2020
	Technical Trends in IoT, Data Science & Artificial Intelligence	PSR Engineering College	02-11-2020 to 17-11-2020
	Technological Advances in Power Switching Converters for Renewable Energy Sources and Fuel Cell Technology for E-vehicles	Bapatla Engineering College: Bapatla	01.06.2020 to 05.06.2020
	Artificial Intelligence, Machine Learning, Internet of Things and Big Data Applications in Power Electronics and Its Allied Areas	GokarajuRangaraju Institute of Engineering and Technology	01.06.2020 to 06.06.2020
	Advances and challenges in Industrial Automation, E-Vehicles, Product and Process Controls Manufacturing in Electrical And Electronics Engineering	QIS College of Engineering and Technology	03.06.2020 to 07.06.2020
	Energy Engineering	National Institute of Technology Agartal	23-11-2020 to 27-11-2020
Mrs.R.Aruna	Advances in Electric Vehicles	RV College of Engineering	9.11.2020 to 14.11.2020
	Futuristic Innovations, Trends in Renewable Energy and Utilization Technologies	V S B Engineering College	23.11.2020 to 28.11.2020
	Technical Trends in IoT, Data Science & Artificial Intelligence	PSR Engineering College	02-11-2020 to 17-11-2020
	Recent trends in Electrical Engineering	Vishnu Institute of Technology	08.06.2020 to 12.06.2020
	Artificial Intelligence, Machine learning, IoT& Big data applications in power electronics and its allied areas	GokarajuRangaraju Institute of Engineering and Technology, Telangana	01.06.2020 to 06.06.2020

	Technological Advances in Power Switching converters for renewable energy sources and fuel cell technology for E-vehicles	Bapatla Engineering College, Bapatla	01.06.2020 to 05.06.2020
	Microgrid Opportunity: Renewable Energy Resources and Buildings	Dayalbagh Educational Institute, Dayalbagh,	16.06.2020 to 20.06.2020
	Advanced Power system simulation software	SSN College of Engineering	25.06.2020to 27.06.2020
Mrs.M.Yamuna	Machine Learning	R.M.K College Of Engineering And Technology	2020-12-7 to 2020-12-11
	Impact of Artificial Intelligence and Deep learning on Internet of things for designing smarter products- A hands on approach	Francis Xavier Engineering College	2020-12-7 to 2020-12-12
	Artificial Intelligence, Machine learning, IoT& Big data applications in power electronics and its allied areas	GokarajuRangaraju Institute of Engineering and Technology, Telangana	01.06.2020 to 06.06.2020
	Microgrid Opportunity: Renewable Energy Resources and Buildings	Dayalbagh Educational Institute, Dayalbagh,	16.06.2020to 20.06.2020
Mr.P.SarathChandran	Tools for Scientific Communication and Effective Teaching	Vaagdevi College Of Engineering	02.06.2020 to 06.06.2020
	Recent trends in Computer Architecture, VLSI and Embedded Systems	GokarajuRangaraju Institute of Engineering and	08.06.2020 to 13.06.2020
	Electric Power Grid Modernization Trends, Challenges And Opportunities	KKR & KSR Institute of Technology and Sciences,Andhra Pradesh,	09.06.2020 to 13.06.2020
	Artificial Intelligence, machine learning, internet of things & big data applications in power electronics and its allied areas	GokarajuRangaraju Institute of Engineering and Technology	01.06.2020 to 06.06.2020
Ms.K.Ajitha	Advances and Challenges in Industrial Automation, E-vehicles, Product and Process	QIS College of Engineering and Technology	3.06.2020 to 7.06.2020
	Tools for Scientific Communication and Effective Teaching	Vaagdevi College of Engineering	2.06.2020 to 06.06.2020
	Technical innovation and research opportunities in power engineering	BNM Institute of Technology	10.08.2020 to 14.08.2020
	Technological Advances in Power Switching Converters for Renewable Energy	Bapatla Engineering College: Bapatla	01.06.2020 to 05.06.2020
	Artificial Intelligence, Machine Learning, IOT and Big Data Applications in Power Electronics and its Allied Areas	GokarajuRanagarajuInstritu utr of Engineering and Technology	1.06.2020 to 06.06.2020

	Energy Management Systems	R.M.D. Engineering College	8.06.2020 to 13.06.2020
	Micro grid Opportunity: Renewable Energy Resources and Buildings	Dayalbagh Educational Institute	16.06.2020 to 20.06.2020

DEPARTMENT ACTIVITIES

CENTER OF EXCELLENCE PROGRAMS

The Department of Electrical and Electronics Engineering has organized following value added course to our students as follows

Sl. No	Year	Course Name	Training Dates
1.	II	Online Course on "PCB DESIGN"	29th June 2020 to 14th July 2020

ONLINE EVENTS ORGANIZED

The Department of Electrical and Electronics Engineering has organized following online events

S.No	Nature of Programme	Title of the Programme	Date	No of Participants	Resource Persons
1.	Two days online FDP	Intelligent Controllers for renewable energy systems	02.06.2020 & 02.06.2020	474	Dr.D.Devaraj Dean, School of Electronics and Electrical Technology Kalasalingam Academy of Research and Education
2.	One day Webinar	Recent Advances in On-Line Condition Monitoring of Transformers	19.06.2020	450	Mr.SAMEER GAIKWAD General Manager, Operations & Regional Sales, South Asia, Doble Engineering Company Mr.ARUN YARGOLE Principal Client Engineer, Doble Engineering Company

STUDENT ACTIVITIES

COURSERA COURSES

IV- EEE

Name	Title	Duration in weeks	Date of certification
P.Rajeshkumar	Electric Power System	5	14.06.2020
	Write A Feature Length Screenplay Film Or Television	5	27.09.2020
P.Rajesh Kumar	Electric Power System	5	14.06.2020
	Write A Feature Length Screenplay Film Or Television	5	27.09.2020
G. Karthick	Electric Power System	5	05.06.2020
K. Karpagasaravanakumar	Electric Power System	5	03.06.2020

III-EEE

V.DivyaMariya	Version Control With Git	4	10.6.2020
	Electric Vehicles And Mobility	6	26.8.2020
M.Maheswaran	Introduction To The Internet Of Things And Embedded Systems	4	09.6.2020
	Natural Gas	4	03.6.2020
	Wind Energy	5	10.6.2020
	Safety In The Utility Industry	4	03.6.2020
	Renewable Energy And Green Building Entrepreneurship	3	03.6.2020
	Electric Power Systems	4	04.6.2020
R.Saravanakumar	Natural Gas	4	04.6.2020
	Safety Utility In The Industry	4	02.6.2020
S.Gowtham	Natural Gas	4	02.6.2020
	Smart Device & Mobile Emerging Technologies	6	03.6.2020
	Wireless Communications For Everybody	6	05.6.2020
	Wind Energy	5	07.6.2020
	Introduction To Project Management	1	07.6.2020
B.Saravanakumar	Natural Gas	4	04.6.2020
	Safety Utility In The Industry	4	01.6.2020
	Programming For Everybody(Getting Started With Python	5	20.7.2020
	Introduction Of Cyber security	4	14.9.2020
V.Saravanabhavan	Natural Gas	4	04.6.2020
	Safety Utility In The Industry	4	01.6.2020
B.Manojvel	Electric Power System	4	06.7.2020

	Safety Utility In The Industry	4	06.7.2020
M.Dineshkaran	Wind Energy	4	24.7.2020
	Electrical Utilities Fundamentals And Future	5	18.7.2020
	Python Programme For Raspberry Pi	4	05.7.2020
	Electrical Power System	4	05.6.2020
	Embedded Hardware And Operating System	4	06.8.2020
DhatchanaaMurrthy M A	Electric Power Systems	4	02.6.2020
	The New Nordic Diet. From Gastronomy To Health	5	02.6.2020
	Foundations Of Public Health Practice: Health Protection	4	26.06.2020
	Cyber security Policy For Aviation And Internet Infrastructures	4	03.6.2020
	Ferrous Technology I	6	01.6.2020
M. AarthiShunmuga Lakshmi	Introduction To Html	9	31.7.2020
	Cyber Security In Manufacturing	4	31.7.2020
	Java Programming :Solve Problems With Software	9	25.6.2020
	Programming For Everybody (Getting Started With Python)	5	10.6.2020
	Version Control With Git	4	08.6.2020
	Electric Power System	4	06.6.2020
	Electric Vehicles And Mobility	6	06.5.2020
	Natural Gas	4	04.6.2020
	Use Canva To Create Social Media Marketing Designs	5	31.7.2020
	Introduction To The Internet Of Things And Embedded Systems	5	26.11.2020
B.Vairalakshmi	Version Control With Git	4	13.7.2020
	Electric Vehicles And Mobility	6	02.6.2020
	Photovoltaic Solar Energy	3	04.6.2020
	Electric Power Systems.	4	09.6.2020
	Digital Manufacturing And Design.	2	14.7.2020
	Cyber Security In Manufacturing.	4	23.7.2020
	Use Canva To Create Social Media Marketing Designs.	1	29.7.2020
R.Karuppasamy	Electric Power System	4	30.09.2020
	Renewable Energy And Green Building Entrepreneurship	3	24.06.2020
	Wind Energy	5	30.09.2020
	Natural Gas	4	24.06.2020
M.Chandru	Electric Power System	4	09.6.2020
	Natural Gas	4	03.6.2020

	Safety Utility In The Industry	4	04.6.2020
M.Maheshkumar	Introduction To The Internet Of Things And Embedded Systems	4	09.6.2020
	Natural Gas	4	03.6.2020
	Wind Energy	5	10.6.2020
	Safety In The Utility Industry	4	04.6.2020
	Renewable Energy And Green Building Entrepreneurship	3	03.6.2020
P Vignesh	Electric Power Systems	4	02.6.2020
S.Arjunsingh	Electric Power System	4	30.09.2020
P.Sivaprakash	Wind Energy	4	24.6.2020
	Natural Gas	4	24.6.2020
	Renewable Energy And Green Building Entrepreneurship	3	24.6.2020
	Covid-19 Contact Tracing	1	18.6.2020
	Safety In The Utility Industry	4	22.6.2020

KNOW YOUR ALUMNI

Mr.P.K. KASIRAJAN

Alumni: 2008

Department of Electrical and Electronics Engineering.

PSR Engineering College,

Sivakasi.

EDUCATION

- Course: Bachelor of engineering in Electrical Engineering.

University: Anna University, Chennai.

Year of passing: 2008

- Course: Master of engineering in High Voltage Engineering.

University: Anna University, Chennai.

Year of passing: 2012

EXPERIENCE SUMMARY

- Al-HerquelPvt.Lts, Dammam, Saudi Arbia,
  Electrical Engineer,
  December 2017 to till date.
- Construction Corner Establishment, ABB service co. ltd, Riyadh, KSA
  Testing and commissioning Engineer.
  August 2015 to November 2017.
- DF Power Systems Private Limited
  Site Engineer.
  June 2012 to May 2015.
- Indo Barath Energies Pvt. Ltd.
  Electrical cum DCS Engineer.
  July 2008 to Aug 2009.

STUDENT ARTICLE

DRAFT: SHOCKLESS EXPLOSION COMBUSTION - EXPERIMENTAL INVESTIGATION OF A NEW APPROXIMATE CONSTANT VOLUME COMBUSTION PROCESS

ABSTRACT

Approximate constant volume combustion (aCVC) is a promising way to achieve a step change in the efficiency of gas turbines. This work investigates a recently proposed approach to implement aCVC in a gas turbine combustion system: shockless explosion combustion (SEC). The new concept overcomes several disadvantages such as sharp pressure transitions, entropy generation due to shock waves, and exergy losses due to kinetic energy which are associated with other aCVC approaches like, e.g., pulsed detonation combustion. The combustion is controlled via the the fuel/air mixture distribution which is adjusted such that the entire fuel/air volume undergoes a spatially quasihomogeneousautoignition. Accordingly, no shock waves occur and the losses associated with a detonation wave are not present in the proposed system. Instead, a smooth pressure rise is created due to the heat release of the homogeneous combustion. An atmospheric combustion test rig is designed to investigate the autoignitionbehavior of relevant fuels under intermittent operation, currently up to a frequency of 2Hz. Application of OH*- and dynamic pressure sensors allows for a spatiallyand time-resolved detection of ignition delay times and locations. Dimethyl ether (DME) is used as fuel since it exhibits reliable autoignition already at 920K mixture temperature and ambient pressure. First, a model-based control algorithm is used to demonstrate that the fuel valve can produce arbitrary fuel profiles in the combustion tube. Next, the control algorithm is used to achieve the desired fuel stratification, resulting in a significant reduction in spatial variance of the auto-ignition delay times. This proves that the control approach is a useful tool for increasing the homogeneity of the autoignition.

INTRODUCTION

Several approaches to realizing a pressure gain combustion or approximate CVC (aCVC) process in a gas turbine were proposed, developed and investigated in the last decades. This is motivated by the higher thermal efficiency of an ideal gas turbine cycle using constant volume instead of constant pressure combustion (Fig. 1). Pulsed jet combustors , pulsed detonation engines (PDE) rotating detonation engines (RDE) and wave rotors are the main types of these devices.

However, even though these systems create a pressure gain in the combustor, they only approximate a constant volume combustion. In a pulsed jet a deflagration wave is responsible for the chemical reaction, which is slow enough to give the products of the chemical reaction time to expand while the flame propagates through the mixture. Thus, the volume increases during the combustion process and no CVC is achieved. In a PDE or RDE, a detonation wave is responsible for the ignition of the fresh fuel-airmixture. Due to the very high velocity of the detonation wave

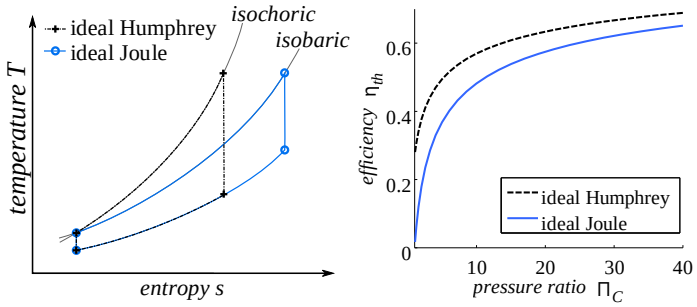

Figure 1. Ideal Cycle Comparison For Constant Volume Combustion (Humphrey) And Constant Pres-Sure Combustion (Joule): T-S Diagram (Left); Efficiency Over Pressure Ratio (Right);

e.g., around 2000m/s for hydrogen–air flames), the mixture is burnt quasi–instantaneously and the volume of the mixture does not change during the combustion process. However, the use of a detonation wave implies a shock wave which is associated with considerable losses. In the wave rotor a mechanically closed chamber is employed to realize CVC . The wave rotor consists of a moving barrel of tubes in which the combustion process takes place without detonation or shock waves. Accordingly, the mentioned losses for the PDC are not present in these devices. However, moving part parts in the hot gas path and cooling pose challenging tasks for this concept.

The shockless explosion combustion (SEC), suggested by Bobusch et al.intends to overcome the shortcomings of other aCVC approaches by further approaching a real constant volume combustion, without shock waves and the associated losses, and no moving parts in the main air path. Like other constant volume combustion processes, the shockless explosion combustion process is based on a periodic combustion process which aims to establish a standing pressure wave inside the combustion tube. The combustion of the mixture occurs in phase with the pressure wave raising the pressure at the tube inlet (Fig.2, bottom). When this pressure wave reduces the pressure at the tube inlet below the plenum pressure (suction wave), the tube is filled with compressor air (Fig.2, left). After filling a small volume with pure air, a well-defined fuel

mass flow is added to the combustion air creating a fuel stratification in axial direction until around 40% of the tube is filled with a combustible mixture (Fig.2, top). The pure air volume is needed to separate the hot flue gases of the previous cycle from the fresh fuel-air mixture to prevent premature ignition. The suction wave is then reflected from the open end of the tube as a pressure wave and travels upstream to the inlet (Fig.2, right). Due to the high temperature of the compressor air, the entire fuel-air volume undergoes quasi-homogeneous autoignition where the mixture is burnt instantaneously and without any shock waves (Fig.2, bottom). The pressure wave is amplified and travels to the end of the combustion tube, where it gets reflected as a suction wave and restarts the process.

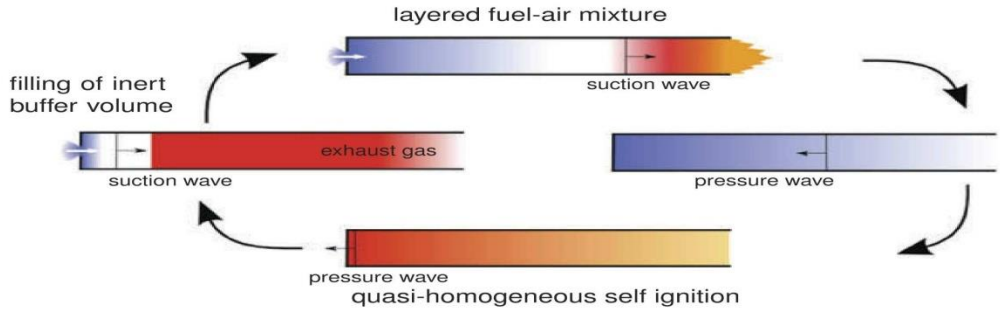

Figure 2.Schematic Of The Sec Cycle

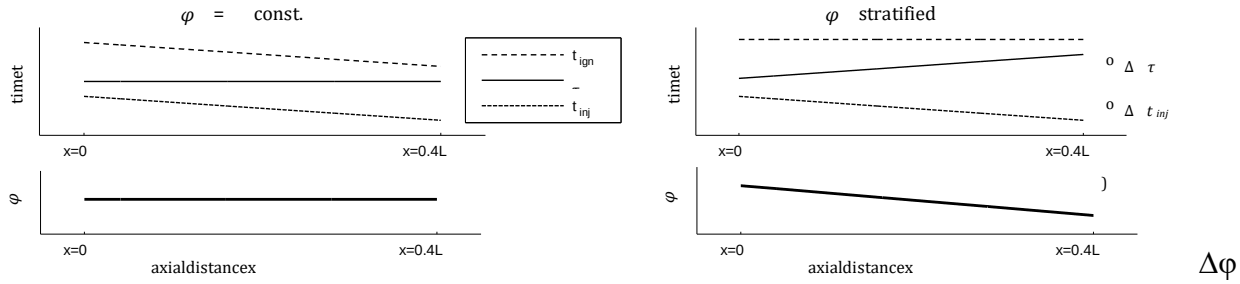

Figure 3. Effect Of Equivalence Ratio Stratification On Ignition Delay Time Distribution

The quasi-homogeneous autoignition, which is a central aspect of the SEC process, is further explained in Figure3, which compares the ignition delay time distribution τ(x) for the case of a constant and stratified φ at the same temperature and pressure level. If the combustion tube is filled on a length of 0.4L with a constant equivalence ratio, every infinitely small mixture volume has the same ignition delay time τ which for constant pressure and mixture temperature Tmixonly depends on the equivalence ratio φ. Therefore, the difference in injection time tinjleads to an axial stratification in ignition time tignwhich prevents a quasihomogeneous auto

ignition (Fig.3, left). Thus, the equivalence ratio needs to be axially stratified, such that the resulting axial ignition delay time distribution τ(x) exactly matches the difference in injection time tinjof the fuel charge. This yields a constant ignition time tign= tinj+τ. In that case tign(x) = const., i.e. the entire fuel-air volume would auto- ignite simultaneously (Fig.3, right).

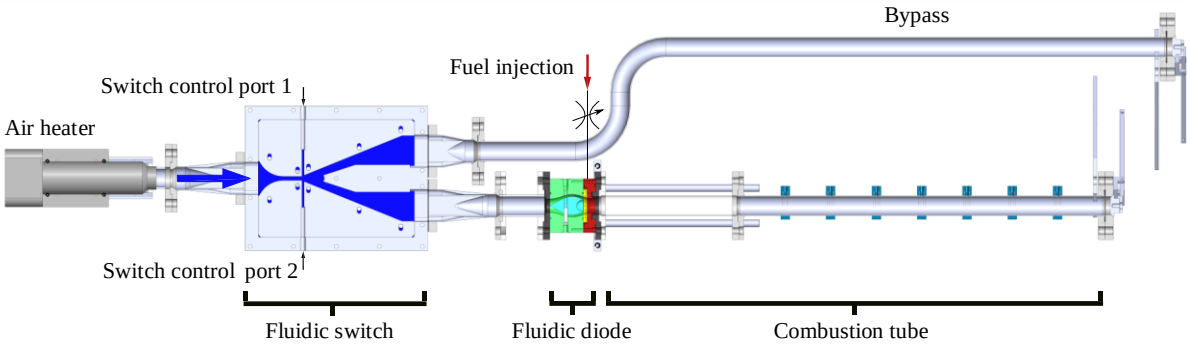

Figure 4. Schematic Of The Atmospheric Sec Test Rig

GokulaPriya.M,

IV-EEE

EDITORIAL BOARD

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING