



॥ विद्या परम् दैवतम् ॥

Wainganga Bahu-Uddeshiya Vikas Sanstha's

WAINGANGA COLLEGE OF ENGINEERING & MANAGEMENT

Near Gumgaon Railway Station, Dongargaon, Wardha Road, Nagpur - 441 114, (M.S.) INDIA
Tel.: 07103 - 202007, 203728 Email: wcem@rediffmail.com, wcem4145@gmail.com, Website-www.wcem.in

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3.3.3 Number of books and chapters in edited volumes/books published in national/ international conference proceeding per teacher during last five years (10)

OVERALL SUMMARY DETAILS

Year	2020-2021	2019-2020	2018-2019	2017-2018	2016-2017
No. of Conference Paper	58	15	7	0	12



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Academic Year 2020-21

Sr. no	Name of the teacher	Title of the book /chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication	ISBN /ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher	Page No.
1	Nitin Sawarkar		Scope of Digital Manufacturing in India after Covid-19	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	4197 - 4201	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	22
2	Ajay Tingurai		Soil Nutrients Testing Using IR Photo Spectrometer	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	2255 - 2263	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	23
3	Bhavesh Bohra		Optimization of strategies for modelling of energy absorbing structure in vehicles	ICAE MS-2021	International Conference on Advances in engineering, Science and Management	International	2020 - 2021	2293 - 2296	Wcem , Nagpur	International Conference on Advances in engineering, Science and Management	24



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					Management					ment	
4	Dr. Tryambak Hiwarkar	Improving Efficiency By Using Synchronised Parallel Data Transmission Over WSN	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	4795 - 4800	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	25	
5	Vivek Korde	Field dependent study on formation of ferroelectric domain in KNbO3	ICAE MS-2021	International Conference on Advance in engineering, Science and Management	International	2020 - 2021	2270 - 2273	Wcem, Nagpur	International Conference on Advance in engineering, Science and Management	26	
6	Ankita Khandait	Impact on Electric Vechiles on Indian Distribution System	ICAE MS-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	577-582	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	27	
7	Prafulla Puri	The nature of catalytic species in wacker oxidation process	ICRF S-2021	International Conference on Research Frontier	International	2020 - 2021	1757 - 899 X	Wcem, Nagpur	International Conference on Research Frontiers	28	



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8	Shravani Jasthi	Security for Multi Cloud Using Server Less Registering Approach	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	4801 - 4804	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	29
9	Vivek Korde	Field dependent study on formation of ferroelectric domain in KnbO3 Single Crystal	ICAM S-2021	International E-Conference on advance in material science	International	2020 - 2021	2270 - 2273	Wcem, Nagpur	International E-Conference on advance in material science	30
10	Manjushree Muley	cosmological model admitting conformal motion	ICRF S-2021	International Conference on Research Frontiers in sciences	International	2020 - 2021	1787 - 899 X	Wcem, Nagpur	International Conference on Research Frontiers in sciences	31
11	Reshma Kadu	Efficiency and Power factor Improvement of three Phase Induction Motor Using just	ICAE MS-2021	International Conference On Advances In Engineering, Science And	International	2020 - 2021	568-576	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	32

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			One IGBT Switch		Management					ment	
12	Sharayu Wasu		The experimental analysis applied to an evacuated tube solar collector equipped with solar parabolic trough and carbon filter for purification of water	ICAE MS-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	2274 - 2284	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	33
13	Rahul Nawkhare		Artificial Intelligence Based Mask Detection with Thermal Scanning and Hand Sanitization Based Entry System	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	1757 - 899 X	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	34



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14	Nitin Sawarkar	Design & Analysis of stress on Drill Bit	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	1757 - 899 X	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	35
15	Bramhadeo Wadibhasme	Impact on Electric Vechiles on Indian Distribution System	ICAE MS-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	577-582	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	36




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16	Swapnil Choudhary	Design & Analysis of stress on Drill Bit	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	1757 - 899 X	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	37
17	Vivek Korde	The nature of catalytic species in wacker oxidation process	ICRF S-2021	International Conference on Research Frontiers in sciences	International	2020 - 2021	1757 - 899 X	Wcem, Nagpur	International Conference on Research Frontiers in sciences	38



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18	Bharat Chede		Optimizati on of strategies for modelling of energy absorbing structure in vechiles	ICAE MS- 2021	Internat ion Confere nce on Advanc e in enginee ring,Sci ence and Manage ment	Inte rnat iona l	2020 - 2021	2293 - 2296	Wcem , Nagpu r	Internati on Conferen ce on Advance in engineeri ng,Scien ce and Manage ment	39
19	Ashish Khelkar		Optimizati on of strategies for modelling of energy absorbing structure in vechiles	ICAE MS- 2021	Internat ion Confere nce on Advanc e in enginee ring,Sci ence and Manage ment	Inte rnat iona l	2020 - 2021	2293 - 2296	Wcem , Nagpu r	Internati on Conferen ce on Advance in engineeri ng,Scien ce and Manage ment	40
20	Ankita Mankar		Efficiency and Power factor Improvem ent of three Phase Induction Motor Using just One IGBT Switch	ICAE MS- 2021	Internat ional Confere nce On Advanc es In Enginee ring,S cience And Manage ment	Inte rnat iona l	2020 - 2021	568- 576	Wcem , Nagpu r	Internati onal Conferen ce On Advance s In Enginee ring,Scien ce And Manage ment	41



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21	Ajay Tinguria		Scope of Digital Manufacturing in India after Covid-19	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	4197 - 4201	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	42
22	Vivek Korde		Cosmological model admitting conformal motion	ICRF S-2021	International Conference on Research Frontiers in sciences	International	2020 - 2021	1787 - 899 X	Wcem , Nagpur	International Conference on Research Frontiers in sciences	43
23	Monika Ingole		Improving Efficiency By Using Synchronized Parallel Data Transmission Over WSN	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	4795 - 4800	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	44



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24	Ashish Khelkar		The experimen tal analysis applied to an evacuated tube solar collector equipped with solar parabolic trough and carbon filter for purificatio n of water	ICAE MS- 2021	Internat ional Confere nce On Advanc es In Engine ring,S cience And Manage ment	Inte rnat iona l	2020 - 2021	2274 - 2284	Wcem , Nagpu r	Internati onal Confere nce On Advance s In Engineer ing,Scien ce And Manage ment	45
25	Rahul Bhandekar		Improving Efficiency By Using Synchroni sed Parallel Data Transmissi on Over WSN	ICAE SM- 2021	Internat ional Confere nce On Advanc es In Engine ring,S cience And Manage ment	Inte rnat iona l	2020 - 2021	4795 - 4800	Wcem , Nagpu r	Internati onal Confere nce On Advance s In Engineer ing,Scien ce And Manage ment	46



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26	Atiq Z. Mirza		The experimental analysis applied to an evacuated tube solar collector equipped with solar parabolic trough and carbon filter for purification of water	ICAE MS-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	2274 - 2284	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	47
27	Amita Suke		Security for Multi Cloud Using Server Less Registering Approach	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	4801 - 4804	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	48
28	Prafulla Puri		Field dependent study on formation of ferroelectric domain in KnbO_3 Single Crystal	ICAM S-2021	International E-Conference on advance in material science	International	2020 - 2021	2270 - 2273	Wcem, Nagpur	International E-Conference on advance in material science	49



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29	Vivek Korde	Graphical Indices of some Chemical structure graphs	ICRF S - 2021	International Conference on Research Frontiers in Sciences	International	2020 - 2021	1757 - 899 X	Wcem , Nagpur	International Conference on Research Frontiers in Sciences	50
30	Swapnil Choudhary	Scope of Digital Manufacturing in India after Covid-19	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	4197 - 4201	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	51
31	Rupali Saha	Security for Multi Cloud Using Server Less Registering Approach	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	4801 - 4804	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	52



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32	Pravin Mandvikar		Efficiency and Power factor Improvement of three Phase Induction Motor Using just One IGBT Switch	ICAE MS-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	568-576	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	53
33	Dr. Bharat Chede		Automatic Temperature Control of Flute in Paper Corrugated Box Manufacturing Machine	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	2293 - 2296	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	54
34	Yuvraj Chavhan		Impact on Electric Vehicles on Indian Distribution System	ICAE MS-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	577-582	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	55



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35	Bhavesh Bohra		Finite Element Analysis of Diesel exhaust fluid tank holding bracket	ICRF S - 2021	International Conference on Research Frontiers in Sciences	International	2020 - 2021	1757 - 899 X	Wcem , Nagpur	International Conference on Research Frontiers in Sciences	56
36	Ashish Khelkar		Optimization of Strategies for Modelling of Energy absorbing Structures in Vehicles	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	2293 - 2296	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	57
37	Dr. Bharat Chede		Design & Analysis of stress on Drill Bit	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	1757 - 899 X	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	58



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38	Shravani Jasthi		Security for Multi Cloud Using Server Less Registering Approach	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	4801 - 4804	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	59
39	Swapnil Choudhary		Automatic Temperature Control of Flute in Paper Corrugated Box Manufacturing Machine	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	2293 - 2296	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	60
40	Dr Bharat Chede		Scope of Digital Manufacturing in India after Covid-19	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	4197 - 4201	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	61



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41	Dr .Bharat Chede		Investigati on of Pipe Inspection Robot by Using Commerci al Package	ICAE SM- 2021	Internat ional Confere nce On Advanc es In Engine ring,S cience And Manage ment	Inte rnat iona l	2020 - 2021	1757 - 899 X	Wcem , Nagpu r	Internati onal Confere nce On Advance s In Engine ring,Scien ce And Manage ment	62
42	Anirudha Bhagwat		Improving Efficiency By Using Synchroni sed Parallel Data Transmissi on Over WSN	ICAE SM- 2021	Internat ional Confere nce On Advanc es In Engine ring,S cience And Manage ment	Inte rnat iona l	2020 - 2021	4795 - 4800	Wcem , Nagpu r	Internati onal Confere nce On Advance s In Engine ring,Scien ce And Manage ment	63
43	Bhavesh Bhora		Optimizati on of Strategies for Modelling of Energyabs orbing Structures in Vehicles	ICAE SM- 2021	Internat ional Confere nce On Advanc es In Engine ring,S cience And Manage ment	Inte rnat iona l	2020 - 2021	2293 - 2296	Wcem , Nagpu r	Internati onal Confere nce On Advance s In Engine ring,Scien ce And Manage ment	64



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44	Swapnil Choudhary		Investigation of Pipe Inspection Robot by Using Commercial Package	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	1757 - 899 X	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	70
45	Aditi Subhedar		Optimization of Strategies for Modelling of Energy absorbing Structures in Vehicles	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	2293 - 2296	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	71
46	Rahul Nawkhare		Soil Nutrients Testing Using IR Photo Spectrometer	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	2255 - 2263	Wcem, Nagpur	International Conference On Advances In Engineering, Science And Management	72



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47	Ashish Bandre		Artificial Intelligence Based Mask Detection with Thermal Scanning and Hand Sanitization Based Entry System	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	1757 - 899 X	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	73
48	Aditi Subhedar		Finite Element Analysis of Diesel exhaust fluid tank holding bracket	ICRF S - 2021	International Conference on Research Frontiers in Sciences	International	2020 - 2021	1757 - 899 X	Wcem , Nagpur	International Conference on Research Frontiers in Sciences	74
49	Nitin Sawarkar		Automatic Temperature Control of Flute in Paper Corrugated Box Manufacturing Machine	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	2293 - 2296	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	75



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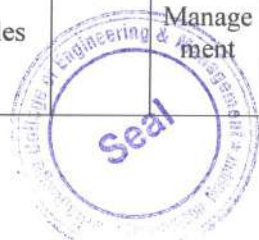


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50	Prafulla Puri		Graphical Indices of some Chemical structure graphs	ICRF S - 2021	International Conference on Research Frontiers in Sciences	International	2020 - 2021	1757 - 899 X	Wcem , Nagpur	International Conference on Research Frontiers in Sciences	76
51	Dr. Tryambak Hiwarkar		Security for Multi Cloud Using Server Less Registering Approach	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	4801 - 4804	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	77
52	Dr. Bharat Chede		Optimization of Strategies for Modelling of Energy absorbing Structures in Vehicles	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	2293 - 2296	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	78



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53	Nitin sawarkar		Investigation of Pipe Inspection Robot by Using Commercial Package	ICAE SM-2021	International Conference On Advances In Engineering, Science And Management	International	2020 - 2021	1757 - 899 X	Wcem , Nagpur	International Conference On Advances In Engineering, Science And Management	79
54	Prafulla Puri		Cosmological model admitting conformal motion	ICRF S-2021	International Conference on Research Frontiers in sciences	International	2020 - 2021	1787 - 899 X	Wcem , Nagpur	International Conference on Research Frontiers in sciences	80
55	Dr. Bharat Chede		Wall Climbing Call Cleaner Robot	International Journal of Innovations in Engineering and Science	International Journal of Innovations in Engineering and Science	International	2020 - 2021	2456 - 3463	Wcem , Nagpur	International Journal of Innovations in Engineering and Science	81



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56	Dr. Bharat Chede		Densification behaviour and its determination during Consolidation processes of Al-SiC metal matrix composites	International Journal of Research in Engineering and Science	International Journal of Research in Engineering and Science	International	2020 - 2021	2320 - 9356	Wcem, Nagpur	International Journal of Research in Engineering and Science	82
57	Dr. Bharat Chede		Design and Development of Transverser car Parking Mechanism	International Research Journal Of Engineering and Technology	International Research Journal Of Engineering and Technology	International	2020 - 2021	2395 - 0072	Wcem, Nagpur	International Research Journal Of Engineering and Technology	83
58	Dr. Bharat Chede		Design and Fabrication of Chainless Bicycle with Folding Mechanism	International Journal of Innovations in Engineering and Science	International Journal of Innovations in Engineering and Science	International	2020 - 2021	2456 - 3463	Wcem, Nagpur	International Research Journal Of Engineering and Technology  Principal	84



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Scope of Digital Manufacturing in India after Covid-19

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Article History: Received: 10 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 28 April 2021

Abstract: Digital Manufacturing has got wide Scope after COVID-19 pandemic Digital Manufacturing is a wider term .in new age of manufacturing, where material and digital innovations makes the industry to achieve the desired design and quantity in shorter time period compared to conventional method. It comprise of ergonomics, human factor analysis, visualization, manufacturing simulation, product design to process and process design. After pandemic there is increase in demand of many commodity for which high rate of production is required to overcome this digital manufacturing can play vital role in overcoming this.

Keywords: Digital Manufacturing, Virtual reality, Smart factory COVID-19

INTRODUCTION

In Indian Scenario after COVID-19 Pandemic, Digital manufacturing can play vital role in balancing the demand and supply of Products as by increasing the Production the required products. Digital manufacturing is basically design centered, control centered, manufacturing centered and management centered. Further if we again go in details of the manufacturing, we can have virtual manufacturing and rapid prototyping. In this century, which is been analysed by network and information, it will change the way of processing, obtaining, transferring and using proper information and high knowledge by human that will propel an significant improvement of human well being, production patterns and social structure.[1] The network manufacturing, E-Commerce manufacturing can be done by information sharing and collaboration. In digital manufacturing all are interconnected digitally by internet, intranet, and extranet. After the manufacturing process has to be checked in digital condition, also control data is loaded to NC machine to start production process.

Manufacturing to digital manufacturing

Digital Manufacturing is nothing but it is use of an integration of computer integrated system comprised of 3 D visualization, Simulation analytic and collective tool to produce product and manufacture the product simultaneously. Conventional way to manufacture where there is line process and in which the design of product and drawing is shared with highly skilled worker in the machine shop for creating the prototype. Whereas in Digital manufacturing we make use of Computer aided design software [2]. These design and process are simulated for checking its feasibility for the manufacturing of the product.

The product is inspected at every level of operations by using computer oriented quality control methods. Digital Supply chain management is very effective in getting the customized product and which helps in reducing the inventory. Social media is involved for digital marketing in order to improve profitability.[3]

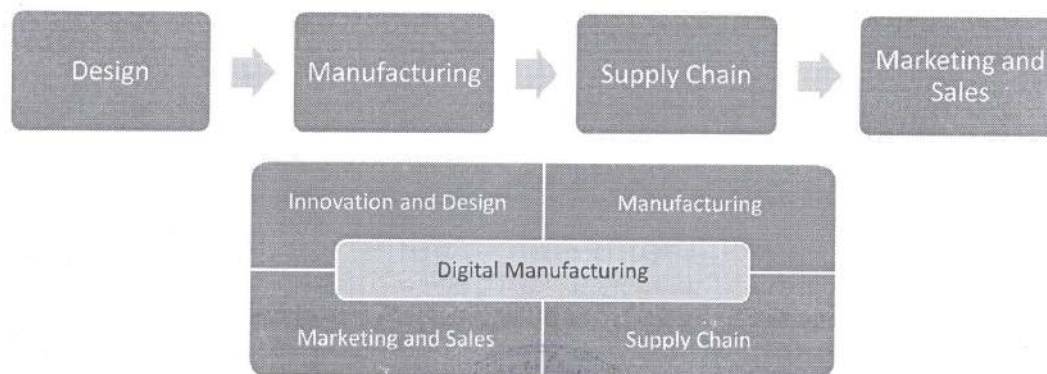


Figure 1 Basic Concept of Digital Manufacturing



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Soil Nutrients Testing using IR Photo Spectrometer

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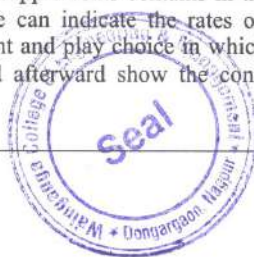
Article History: Received: 11 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 4 June 2021


Abstract: In India 70 of the general population economy clearly or by suggestion depending on the agricultural association, which can be 15 - 20% of offers in the hard and fast Indian economy. It's a huge neighborhood a Green Nation India. In view of the shortfall of preparation and old advancement consistently a considerable number of farmers doing implosion in light of less productivity. Our Project's standard way to grow the productivity of the best piece of the general population to evolve the rural country into a made country. To make this dream of made country we need to examine the cultivating territory for present-day propels. One of them we are finding in all cases free structure to measure the soil supplements are N (Nitrogen), P (Phosphorus), K (Potassium) and show with their thought for farmers at their own lingos like English, Hindi, Marathi (Regional Language Support) to better transparency of an enormous bit of the clueless social classes. With the help of this endeavor, we need to change the circumstance of developing in India. For this, we are developing the system from the above feature with its own power supply necessities fulfilled by Solar Energy and advanced lithium-molecule battery pack. We are developing the system in what course the soil testing technique is at present done in the exploration place by an answer/substance-based testing whose important 6 - 10 Hours of time are cleared out and our farmers can test its earth at its own site two or three minutes. While developing this system we are thing about to 95% of accuracy over the lab

Keywords: Soil Nutrients, IR spectrophotometer, Precision Agriculture, DSP Processing.

1. Introduction

India is an Agricultural country, thus we are compelling to an agrarian field while picking our task. While we study the current circumstance in the agrarian field we will track down a 60 - 75% of the Indian Economy is dependant on Farmers who are living in unassuming communities and towns. Out of the most people groups are unskilled. Large numbers of the public authority authorities and manures provider or the people groups experiences in this field they are taken benefits of the absence of lack of education of their clients which are the helpless ranchers. We can track down the main downside in our ranchers while they are developing their territories by deficient information on their areas soil and water quality that is the reason the profitability is extremely poor now and then it not may recuperate their put away cash for development and their actual endeavors. Out of them, a few ranchers are taught henceforth they ought to follow the logical method of cultivating and get great outcomes. However, the cash and speculation are more in an ordinary method of soil testing procedure. Currently, soil testing is done in just the labs whose don't put close to ranchers, henceforth 90% of people groups can skirt this interaction and follows the regular method of the estate, treatment, and water supply. To make an Indian economy and GDP a lot more grounded we need to instruct or mindful our ranchers about how much soil wellbeing upkeep and improved by providing appropriate supplements to it. In the dirt there are numerous supplements are available out of this three principle significant supplements are N (Nitrogen), P (Phosphorus), K (Potassium), and other are optional supplements like a C (Calcium), S (Sulphur), M (Magnesium), C (Carbon), H (Hydrogen), O (Oxygen), and so forth Horticultural scientists are determined how to supply supplements in the dirt by straightforwardly forced or provided through the water. In this undertaking our mean to gauge every one of those supplements and show them on the screen to find satisfactory ways to keep up supplements in the dirt on the off chance that the dirt is solid, our crop likewise becomes sound and delivers huge creation to help the abundance of our ranchers. This why we are making an independent and simple to-utilize framework with the provincial language whose effectively open to peruse data to our ranchers. Until we are doing an investigation on the most proficient method to quantify the supplements inside the dirt with no substance cycle collaboration which are effectively open runs with no consumable parts or fluid and zero support cost. While building up the framework above is the principle reason for the on the grounds that the people groups which are utilizing our framework they don't have effectively supply of required synthetic substances and support parts. From the examination, we have found another system that can be performed by as it were the Light source and photodiode called a Photospectrometer. In this interaction one of the light sources whose can 750-1500nm frequency passed from the under testing soil test, according to the supplements contains in the dirt it will mirror back the light beams at a specific frequency. As per radiation, we can indicate the rates of supplements that contain it. Performing this interaction is very is it like an attachment and play choice in which the sensor should profound into soil least of 30mm separation from the surface and afterward show the consequences of its supplements on Display. In




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2255

Optimization of Strategies for Modelling of Energyabsorbing Structures in Vehicles

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Article History: Received: 11 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 4 June 2021

Abstract: Crash performance is imperative to ensure safety of vehicle. A major challenge in the design and optimization of vehicle crash systems is the high computing costs needed for crash analysis. It is imperative that energy-absorbing structural principles can be introduced and optimized at the early stages of vehicle design in order to improve crash efficiency by creative and optimized vehicle architecture. Through developing rapid modelling strategies, this potential can be maximized. In this paper modelling approaches are investigated using Finite Element Method for one application. Description for energy absorption structures are studied and implemented into new user defined model description for an explicit Finite Element Crash Solver. The simplified energy absorbing structure is verified using Finite Element Models

Keywords: Energy Absorption Structures, Finite Element Models, Crash Performance, Optimization, Rapid Modelling

1. Background

With increase in the number of population, there is increase in the number of vehicles on road, leading to accidents. Passenger safety is of the topmost criteria. Vehicle design is incorporated with Energy Absorbing structures; these help in absorbing the impact caused due to sudden collision of car or violent deceleration. Hence design of Energy Absorption structure plays a crucial role in Vehicle validation. A computational cost for assessing Crashworthiness of the vehicle is very high. Hence to minimize the cost required for the Crash analysis of the vehicle, energy absorbing structures are optimized at early stage of vehicle design.

2. Motivation

Lightweight vehicle structure has always been the interest of manufactures, as it increases the payload capacity and decreases the cost in manufacturing. Vehicle design or vehicle structure needs to be validated. Validation of the vehicle structure is done in three different ways namely – analytically, numerically and prototype testing. Numerical validation of the vehicle is given more importance as it gives accurate results than analytical method and the cost of prototype build is skipped. To reduce the computational cost involved in crash analysis of the vehicle structures, Energy Absorption Structures are optimized in the early phase of vehicle design to reduce the cost and get the optimum design of Vehicle.

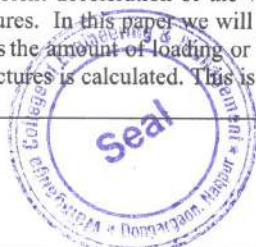
3. Objective

The Objective of the paper is to optimize the design of Energy Absorption structures. The optimization process includes exploring the rapid modelling strategies by understanding the manufacturing capabilities for Laser Beam Melting additive manufacturing process. This is done to get a better visual of the design of the Energy Absorption Structure prototype made through Additive Manufacturing during the optimization process. The optimized design of the Energy Absorption Structure is validated structurally in Ansys to understand the deformation and stresses experienced by it.

4. Statement of Contribution and Methods

4.1 Optimization of Energy Absorption Structure

Energy absorption structures are the mechanical structures, designed to absorb maximum energy experienced by the vehicle during vehicle frontal crash. Optimal design of energy absorption structures complies to higher energy absorption capabilities of the structures. Hence, optimization of energy absorption structures, includes, optimal geometry and material selection for the structure. Rapid modelling strategies are explored at the design stage to understand the design closely for analysis and better visualization. When the vehicle is in motion, it acquires kinetic energy. After the collision of the vehicle, this kinetic energy gets converted into destructive mechanical energy due to sudden and violent deceleration of the vehicle. This destructive mechanical energy is absorbed by the energy absorption structures. In this paper we will be considering direct and oblique collision of the vehicle. For these two impacts what is the amount of loading or in other words amount of violent deceleration experienced by the energy absorbing structures is calculated. This is done to evaluate the stresses and deformation



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2293

Improving Efficiency By Using Synchronised Parallel Data Transmission Over Wsn

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Article History: Received: 10 November 2020; Revised 12 January 2021 Accepted: 27 January 2021; Published online: 5 April 2021

Abstract: As the data transmission speed and the efficiency over the wireless network depend on the network or transfer device bandwidth. After physical implementation of wireless network which is difficult to dynamically control transfer in order to get high or low data transfer rate. Dedicating the fixed network for such a dynamic requirement network is not feasible. Many researchers are trying to enhance the wireless network speed by joining the transfer speed of multiple lines which will result in to asynchronous data transfer and data leakage. Hence the proposed system is to design and implements a dynamically controllable wireless network using the multiple radio frequency wireless devices. Here the proposed system will use multiple wireless devices and transfer data over multiple line depending upon the user configuration and synchronize the data over the receiving end. It will let the user control the wireless data transmission speed as per the requirement.

1. Introduction


Wireless Sensor Networks (WSNs) are a new class of networking technology that is increasingly becoming popular today. Huge strides taken in sensing technology, low power microcontrollers and communication radio have spurred the mass production of relatively inexpensive sensor nodes. Such large scale sensor networks far reimburse use of conventional networks in situations where terrain, climate and other environmental constraints obstruct the deployment and setting up of regular networks. Because of the tremendous scale at which such nodes can be deployed, they are extremely robust in terms of individual node failures which make them all the more favorable in such extreme situations. There has been an explosion in the use of sensor networks for environmental measurement and study. A range of applications have been built using sensor networks, from environmental monitoring to radiation detection to lots of tracking applications.

Broadly, sensor applications can be categorized into data gathering or tracking. Data gathering applications use sensor nodes to periodically measure the value of a particular environmental variable and recorded values are collected by a sink node for further processing. A WSN typically consists of a large number of low-cost, low-power and multifunctional sensor nodes that are deployed in a region of interest. These sensor nodes are small in size but are equipped with sensors, embedded microprocessors and radio transceivers and thus they have not only sensing capability, but also data processing and communicating capabilities.

Sensor networks have the following unique characteristics and constraints:

- (i) Dense node deployment
- (ii) Battery powered sensor nodes
- (iii) Severe energy, computation and storage constraints
- (iv) Self configurable
- (v) Unreliable sensor nodes
- (vi) Frequent topology change
- (vii) No global identification
- (viii) Many to one traffic pattern




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Field dependent study on formation of ferroelectric domain in KNbO₃ single crystal

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Article History: Received: 11 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 4 June 2021

Abstract: The study of ferroelectric domains is essential for understanding the orientation of electric dipoles. This orientation of electric dipole shows the defect and impurities formation in a ferroelectric single crystal. Domain study is important for studying formations of defects and movement of dipoles in Al-doped KNbO₃ single crystal. The Al-doped KNbO₃ ferroelectric Single-crystal prepared using flux methods; then it chemically etched using methyl alcohol and nitric acid as an etchant. The electric field of 50 V/cm, 60 V/cm, and 70 V/cm was applied to the doped crystal. The variations of domain structure after the applying electric field are observed using the Trinocular microscopy method

Keywords: Domain Impurities: KNbO₃; Electric Field

1. Introduction

The ferroelectric material is a crucial part of the perovskite family of the materials [1]. These devices mainly include memory devices, sensors, electro-optics, and LASER. Simultaneously ferroelectric materials are also used in pyroelectric and piezoelectric devices. A lot of modification has been done on ferroelectric materials [2]. Various scientists worldwide and studies have done a broad review about its dielectric properties, hysteresis loop, and mainly domain research. Many ferroelectric materials are currently available for analysis; they mainly include PbTiO₃, BaTiO₃, and PbZr/TiO₃ materials and have undergone many modifications [3]. Among these, on KNbO₃ [KN] materials, Korde and Patil et al. has done a lot of work in their lab. The different dopants in KN materials such as aluminum (Al) and ferrous (Fe) are used for doping. This doping combination changes the properties of these crystals [3-5].

KN Materials is a perovskite structure element. KN and BaTiO₃ have many similarities; both at room temperature in a single crystal shows orthorhombic phase [6]. As it has different doping adds, its structural properties change. KN single crystal has another important stuff in that it shows phase transition [7]. Phase transitions mean its phase changes at different temperatures, due to which the structure of KN changes, which is very important for practicing dielectric properties and study its hysteresis loop [4]. Formations of hysteresis loop are the main parameter to check the ferroelectric properties of materials. In KN well saturated rectangular hysteresis loop has formed the shape of hysteresis loop were changed by adding different dopant. Also, the parameter value of hysteresis loops such as spontaneous polarization, remnant polarization, and coercive were altered by dopant change [8].

Domain engineering is the main field of science that studies the orientations and formations of ferroelectric domains. The ferroelectric domains are a crucial part of ferroelectric to understand the various structural behavior defects and imperfections produced in the ferroelectric crystals[9]. This article studies the electric field's effects on the ferroelectric domains in various doped KN single crystals.

2. Experimental Studies

2.1. Crystal growth

The KN single crystal has been prepared using the flux method. Al and Fe doping was used while preparing the KN crystal. While preparing, the crystal K₂CO₃ and Nb₂O₅ powder were taken in the ratio of 1.2:1, and it was mixed. Afterward, this mixture was taken in the mortar and crushed for 5 to 6 hours and made into a fine powder. The same finely mixed powder Fe and Al are doped with suitable concentration. In the last, this doped composite powder is placed in a platinum crucible, and this platinum crucible is placed in a programmable furnace. This program runs continuously for eight days and comes with different steps: heating, cooling, soaking and reheating, recooling, and resoaking. In this way, this doped powder is heated up to its highest temperature of 1100°C, and finally, doped KN single crystal was prepared [10].

2.2. Methods of Microscopy

To study the domain properties of crystal; the most important instrument for the observations of domains is microscope. Different microscopes like atomic force microscopy (AFM), Scanning probe electron microscopy are



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The nature of catalytic species in the Wacker oxidation process- A review

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Abstract. The catalytic structure of the Wacker process is matter of debate. It is monomer or dimer complex in the Wacker oxidation of ethene. In this paper, we studied catalytic nature of the Wacker oxidation process. We employed rare event technique such as metadynamics simulation. We used Pd-Cu and Pd-Pd dimer complex as the initial structure. Our simulations show that Pd-Cu and Pd-Pd dimer complexes are getting hydrolysed to give monomeric complex. The barriers of Pd-Cu and Pd-Pd dimer complexes to hydrolysis are lower than the reactions with ethene ligand. Hence, the nature of catalytic complex in the Wacker oxidation is the monomeric complex of Pd.

Keywords. Pd-Cu dimer complex, Pd-Pd dimer complex, Metadynamics

1. Introduction

During the oxidation of olefines during the Wacker oxidation, the Pd(II) catalyst first reduces to Pd(0) which in turn is oxidized back to Pd(II) by CuCl₂ salt in the reaction mixture. In this redox reaction, Cu(II) is reduced to Cu(I) and further oxidized back to Cu(II) by molecular O₂. A generally accepted mechanism of the Wacker process has mono-nuclear Pd(II) complex as the catalytic species[1]. This is supported by the fact that [CuCl₂] terms are not present in the rate-equation of the Wacker process. However, the genesis of a Pd-Cu bimetallic complex in the Wacker process cannot be completely ruled out, especially after the reduction of Pd(II) to Pd(0) assisted by CuCl₂[2].

Crystal structures of oxo-bridged Pd-Cu complexes in polymeric form have been reported[3]. In the N,N-dimethylformamide (DMF) solvent, Pd-Cu dimeric complex with DMF bridges have been isolated during the oxidation reactions[4]. In these structures, one or more ligands are bridging the Pd and Cu centers. There are also reports in the literature suspecting the Cl bridged dinuclear Pd complexes as the catalytic species[5]. Different rate-expressions are observed under non-aqueous or mixed solvent conditions pointing to the formation of dimeric complexes. More importantly, ESI-MS study of the Wacker oxidation in mixed solvents by Harakat et al.[6] has reported the fingerprints of reactive dinuclear Pd intermediates.

The Wacker oxidation by Pd-Cu bimetallic catalytic complex was modeled by static DFT calculations by Keith et al.[7], in order to mimic high [CuCl₂] conditions. Continuum solvent model was used in these calculations to model the aqueous conditions. An outer-sphere water attack was known to be the rate-determining step using the bi-metallic catalyst, and the effective reaction barrier was lowered by 4 kcal mol⁻¹ compared to a monomeric Pd(II) catalyst. However, in their calculations, finite solvent molecules were not considered which is crucial for modeling the Wacker oxidation and the stability of the dimeric bimetallic catalyst was not determined. In a different study, Kragten et al.[8,9] used a Pd dimer model to investigate Wacker oxidation in acetic acid. Wacker oxidation using Pd-Cu bimetallic and Pd-dimer complexes in tertiary butanol solvents in the presence of nitrile co-catalyst was recently

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Security for Multi Cloud Using Server less Registering Approach

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Article History: Received: 10 November 2020; Revised 12 January 2021 Accepted: 27 January 2021; Published online: 5 April 2021

Abstract: These days, in any application development, security for specific area has become crucial job in the service access environment. Since clients needs to utilize the unique services and resources in distributed computing environment. Here the security administrations and cloud portal frameworks have been highly advanced based on the client necessities. However cloud offers a lot of resources through the global service vendors and Multicloud technologies are rapidly in use, but still the cloud requires security enhancement. Applications become complex and have attacks when deployed on multiclouds .So it is very important factor to protect the data and resources from the hackers. In multiple cloud environments it is possible to control all the applications, user resources, secret information and other confidential user process level with the help of server less approach. The server less computing approach is a sort of Distributed computing execution model through which Cloud Service provider will allocate the resource to the client in a dynamic manner .This paper represents what is Multi cloud, advantages of Multicloud, Why Security issue with Multi cloud, How server less is different from monolith services and Security Approaches to multi cloud with server less computing.

Index Terms: cloud services, multicloud, server less computing

1. Introduction

As we know Cloud delivers computing power (CPU, RAM, Network Speeds, Storage OS software) a service over a network called Internet. But if all the resources and services of the website are on one cloud, a DDoS (Distributed Denial of Service) attack can take the website down, sometimes the single cloud service provider cannot fit all requirements to the tee. Hence many organizations are making use of multiple cloud environments. Multicloud is an approach which contains more than one cloud, mix of public and

private cloud components where service provided by different vendors. Fig:1 represents overview of multi cloud environment. Organizations/IT sectors normally deploy Multicloud environments to meet various IT-related goals like improved flexibility, reduced costs for IT services, avoiding vendor lock-in (restructure of the functions will be easy), and tapping into regional cloud providers (especially some companies operate globally, where a single provider may not be available in certain locations, or where they offer specific cloud features might be unavailable).

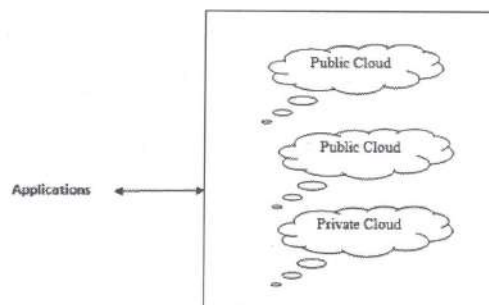


Fig1: Multi Cloud Representation

Public cloud platforms are available from third party vendors like Amazon Web Services, Microsoft Azure, Google Cloud Platform, Alibaba Cloud, the IBM Cloud, and others. Private cloud means delivering cloud services



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Field dependent study on formation of ferroelectric domain in KNbO₃ single crystal

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Article History: Received: 11 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 4 June 2021

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Keywords: Domain Impurities: KNbO₃; Electric Field

1. Introduction

The ferroelectric material is a crucial part of the perovskite family of the materials [1]. These devices mainly include memory devices, sensors, electro-optics, and LASER. Simultaneously ferroelectric materials are also used in pyroelectric and piezoelectric devices. A lot of modification has been done on ferroelectric materials [2]. Various scientists worldwide and studies have done a broad review about its dielectric properties, hysteresis loop, and mainly domain research. Many ferroelectric materials are currently available for analysis; they mainly include PbTiO₃, BaTiO₃, and PbZr/TiO₃ materials and have undergone many modifications [3]. Among these, on KNbO₃ [KN] materials, Korde and Patil et al. has done a lot of work in their lab. The different dopants in KN materials such as aluminum (Al) and ferrous (Fe) are used for doping. This doping combination changes the properties of these crystals [3–5].

KN Materials is a perovskite structure element. KN and BaTiO₃ have many similarities; both at room temperature in a single crystal shows orthorhombic phase [6]. As it has different doping adds, its structural properties change. KN single crystal has another important stuff in that it shows phase transition [7]. Phase transitions mean its phase changes at different temperatures, due to which the structure of KN changes, which is very important for practicing dielectric properties and study its hysteresis loop [4]. Formations of hysteresis loop are the main parameter to check the ferroelectric properties of materials. In KN well saturated rectangular hysteresis loop has formed the shape of hysteresis loop were changed by adding different dopant. Also, the parameter value of hysteresis loops such as spontaneous polarization, remnant polarization, and coercive were altered by dopant change [8].

Domain engineering is the main field of science that studies the orientations and formations of ferroelectric domains. The ferroelectric domains are a crucial part of ferroelectric to understand the various structural behavior defects and imperfections produced in the ferroelectric crystals[9]. This article studies the electric field's effects on the ferroelectric domains in various doped KN single crystals.

2. Experimental Studies

2.1. Crystal growth

The KN single crystal has been prepared using the flux method. Al and Fe doping was used while preparing the KN crystal. While preparing, the crystal K₂CO₃ and Nb₂O₅ powder were taken in the ratio of 1.2:1, and it was mixed. Afterward, this mixture was taken in the mortar and crushed for 5 to 6 hours and made into a fine powder. The same finely mixed powder Fe and Al are doped with suitable concentration. In the last, this doped composite powder is placed in a platinum crucible, and this platinum crucible is placed in a programmable furnace. This program runs continuously for eight days and comes with different steps: heating, cooling, soaking and reheating, recooling, and resoaking. In this way, this doped powder is heated up to its highest temperature of 1100°C, and finally, doped KN single crystal was prepared [10].

2.2. Methods of Microscopy

To study the domain properties of crystal; the most important instrument for the observations of domains is microscope. Different microscopes like atomic force microscopy (AFM), Scanning probe electron microscopy are



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Cosmological model admitting conformal motion

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Abstract. In general theory of relativity cosmological model of spherically symmetric string cloud has been investigated with respect to electromagnetic field. In present work conformal motion of one parametric group was used to obtain Einstein field equations solution.

Keywords: Cosmological model; conformal motion.

1. Introduction

The string theory was developed [1, 2] after the big bang outburst. Phase transition play an important role for arrangement of topological constant imperfection such as domain walls [3, 4], domain wall motion [5, 6], strings and monopoles. String produce torque and stress energy which is similar phenomenon shown in gravitational field. Letelier et al. [7] obtain explanation of Einstein field equation for a cloud of string of various symmetries. String theory is important and broad that solve many important questions of fundamental physics and mathematics. The interaction and propagation of string with each other is briefly described by string theory. It is possible to unify known forces and particles using string theory. The magnetic field plays a vital role in cosmology, galactic and intergalactic spaces. Melvin et al. [8, 9] studied about matter which is in highly ionized state predict it responsible for expansion of universe. Herrera et al. [10] obtained solution for isotropic and anisotropic matter in framework of general relativity [11]. Yauz et al. [12, 13] have solved the Einstein field Equations through conformal motions space-times in the context of string by using one parameter group of conformal motions [14].

In the present work explanation of gravitational field equation for space-times is obtained by using conformal motions with respect to magnetic field.

The energy- momentum tensor of string implies as.

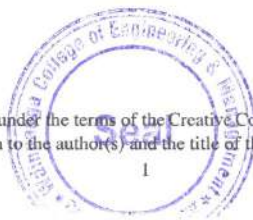
$$T_{ij} = \rho u_i u_j - \lambda x_i x_j + E_{ij} \quad (1)$$

Here ρ is the rest energy cloud string and λ is the string tensor density.



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Efficiency and Power factor Improvement of Three phase Induction motor Using just one IGBT switch

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Abstract- With the help of proposed scheme the chopped and modulated three phase AC voltages appears across the stator terminals. The Three phase induction motor makes use of single controllabled IGBT switch connected across the three phase diode bridge rectifier forming A.C. switch for chopping three phase A.C. voltage. With the help of given technique the chopped and modulated three phase A.C. voltages appear across stator voltage terminals of three phase induction motor. The of A.C. voltage magnitude is controlled with the help of high frequency PWM controlled switch. The peculiar feature of this scheme with high frequency controlling the speed and power factor of induction motor with single semiconductor switch. The speed of the three phase induction motor with fan load will be controllable within around 50% of the rated motor speed. This induction motor drive find utility in Industrial high power cooling fans, blowers and pumps. This drive will provide higher efficiency, improved power factor and required speed control over wide range for above applications with simple design and control feature and good economical advantage.

Keywords- Three phase Induction motor, PWM technique, IGBT, power factor, VVVF drive.

1. INTRODUCTION

The main limitation of firing angle control technique using SCR bridge is very poor power factor at low speed control range and thereby increase in source current requirement for a required power output. Another technique of speed control which is most common and widely popular is voltage variable frequency drive with PWM technique the speed is controllable in wide range but it requires one additional power factor more improve stage by using additional bridge rectifier and IGBT switch in boost converter topology, the efficiency of the converter reduced due to additional stage and difficulty and cost of the circuit is also increase.

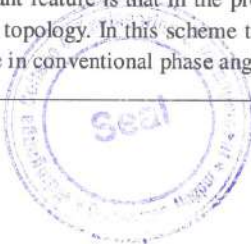
The inverter is construct with the help of six controllable switches operated consequent manner. The control techniques required exact sequential control of six switches using SPWM or SVPWM. In current situation power conservation is an main issue across the world. This project mostly deals with the minimum power utilization by enhancing

the output efficiency and providing capacitor as a freewheeling element of three phase squirrel cage Induction motor, it requires less maintenance and rugged in construction. For industrial application induction motors are most favoured and widely used drive in pumps, fans and blower. Speed control techniques of these machines can be achieved by various methods [1].

2. PROPOSED TECHNIQUE

Phase angle control (PAC) technique was used earlier for this purpose but it has some disadvantages such as lagging power factor at the input supply side especially at low speeds due to increased firing angle.

To get rid of above disadvantages, the said research work focuses on reduce in power consumption and enhancing power factor of induction motor drives. A variable voltage control scheme is suggested using diode bridge by varying duty ratio of the bridge for said induction motor drives. A 3 KHz high frequency PWM controlled direct AC to AC voltage controlled converter is suggested for three phase induction motor to enhance the efficiency and improve input power factor and speed control along with fan using three phase induction motor. In this advanced technique only one active switch and six diodes are connected to form a bridge. The current continuity in the stator winding of the motor is maintained using parallely connected low value capacitors causing free wheeling action in both quarters of AC voltages. The three phase balanced voltage fed to stator the motor is controlled simply by varying duty ratio of diode bridge. Motor current control is not allowed to lag much more as in the technique using firing angle control. The main features of the scheme are high frequency of 3Kz PWM switching and by eliminating additional three A.C. switches that is SCR, in place of it we are using here three parallel connected low value capacitors, which gives high power factor and high efficiency and one more thing is minimum number of controlled power semiconductor switches are required. One more dominant feature is that in the proposed scheme here we are using single active IGBT switch instead of using six or four A.C. switches topology. In this scheme the induction motor drive can operate in entire complete range of speed and torque which is not possible in conventional phase angle control scheme. The supply current from AC



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