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PARTICLE BREAKAGE PHENOMENA DURING HANDING ANALYSIS

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Abstract
Breakage characteristics of particles were tested by using a drop test apparatus to analysis the material breakage process during handling. This article contain the several drop tests to determine the breakage characteristics of coal such as: Cushioning test, Impact tests, Various sizes tests, and Weathering tests. The presence of fines with lump size material had a cushioning effect, which reduced the lump breakage. The drop test results for weathered coal samples shows that the rate of fines generated was increased with the period of weathering.

INTRODUCTION

A research was commissioned by an Australian Port to maintain the strict coal particle size requirements for the COREX steel making process. Australian loads export the coal for a steel plant located in India.

The COREX Process is a unique and modern process of iron making that has many distinct advantages over the conventional blast furnace iron making process. This process does not require coking coal and uses only thermal coal for generating heat, production of the reducing gas and provision of adequate bed permeability.

The Mean Particle Size (MPS) of coal is an important factor for the COREX process because a decrease in the MPS reduces the permeability of the char bed resulting in gas channelling, which drops the hot metal temperature and quality.

Degradation is defined as the reduction of a particle size fraction to a smaller size fraction through the range of final products expressed as a percentage. Coal lumps frequently command better prices than fines so that degradation during transportation and handling can represent a considerable loss in revenue. Fines are difficult to transport during dry conditions, because of air pollution. The breakage forces, which act on coal during handling are impact and attrition.

LITERATURE REVIEW

Degradation characteristics of various ores and coal types due to particle breakage have been studied by a number of researchers to determine the causes of degradation and its prevention during the handling process from mines to end users. Degradation was defined by Goodwin and Ramos [1]; Teo et al. [2] and Sahoo [3] as the reduction of a given size fraction to a smaller size fraction through the range of final products expressed as a percentage of the whole. Few studies had been undertaken to quantify the process of degradation and there is a very little literature in this area are reported by Hocke and Jones [4], Ooshima et al. [5], Balajee et al. [6] and Kelly et al. [7]. The study by Fagerberg and Sandberg [8] shows that the transportation of iron ore, coke and limestone from mines to steel plant, produced unwanted fines. With the great technical and economical problems, efforts had been made to reduce degradation.

EXPERIMENTAL PROCEDURE

The drop test apparatus of 10 m height is used to measure the breakage characteristics of coal for four different drop tests and they are: Cushioning test, Various sample sizes test, and Weathering test.

A fifteen-meter drop tower constructed from steel scaffolding and the entire structure was enclosed with thick plastic sheeting to prevent loss of broken coal particles. The tower was used overhead cranes of 5 tonne capacity to raise the release hopper. The coal sample under test was contained in a bottom-release hopper that allowed the coal to be dropped from various heights. The release hopper was 70 cm by 40 cm. A steel surface of size 2 m × 2 m × 3 mm was positioned at the base of the drop tower.

Coal samples of Blackwater and Ensham (West) coal are collected from the stockpile of Gladstone port by mechanical sampling methods.

RESULT AND DISCUSSION

Cushioning test

Cushioning effects consists of five different types of tests. The different tests are outlined in Table 1.

Table 1: Definition of types of cushioning tests.

Types of Cushioning tests	Name of cushioning tests	Definition
A	Non-Cushioned coal tests	Sample size to be tested was −76.2 + 50.8 mm
B	Cushioned coal tests	The fines component is removed after each drop and the test repeated
E	Cushioned coal initial 50% fines tests	The initial drop has no fines but the fines produced at each repeated drop is not removed
		As in (B) but the first drop contains 50% fines

A CONDUCTING FLUID MHD SYMMETRIC FLOW BETWEEN PARALLEL POROUS DISKS

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A problem of axially symmetric source flow of a conducting fluid between parallel porous disks in the presence of a transverse magnetic field of uniform strength fixed relative to the fluid is considered. The solution obtained is in the form of an infinite series expansion in terms of source Reynolds numbers. The radial velocity distribution for various values of Reynolds number and Magnetic parameters has been shown in different graphs and tables.

I. INTRODUCTION:

The flow of electrically conducting fluid through a channel and between two parallel plates in presence of a transverse magnetic field is encountered with a verity of applications such as MHD generators, pumps and flow meters.Khan[1] has investigated the laminar source flow of viscous liquid between porous disks rotating with the same speed. Elkouh [4] generalized this problem and obtained an infinite series solution. Roy etal. [2]. andBiswal [5] have solved similar problems taking Visco elastic liquids. Attia and Kotb[6] studied the steady fully developed flow between two parallel plates with temperature dependent Viscosity. Mishra and Muduli [3] have studied the problem of hydro magnetic flow due to a constant source between parallel plates.Seddeek [7], Sadeghy et al [8] and Abbas et al. [9] have studied MHD Visco-elastic flow and got interesting results. In the preset paper, we have studied the laminar symmetric flow of a viscous incompressible and electrically conducting fluid due to a constant source in the presence of an externally applied transverse magnetic field of uniform strength fixed relative to the fluid between two parallel infinite porous disks.The MHD boundary layer flow and heat transfer of a third order fluid flowing in a porous channel has been studied by Sinha [10]. The walls of the channel are considered to be porous and stretchable where thesurface velocity is proportional to the longitudinal distance from a fixed point.A numerical study is carried out by Ashraf et al. [11] for the axisymmetric steady laminar incompressible flow of an electrically conducting micropolar fluid between two infinite parallel porous disks with the constant uniform injection through the surface of the disks.The fluid is subjected to an external transverse magnetic field.

2. FORMULATION OF THE PROBLEM:

We consider the steady flow of an electrically conducting fluid between two infinite parallel porous disks in the presence of a magnetic field. Two disks are in the planes $z = 0$ and $z = a$. The equations of motion of electrically conducting fluid neglecting electromagnetic induced effect are:

$$uu_r + vu_z = -\frac{1}{\rho}p_r + \upsilon\left(u_{rr} + u_{zz} + \frac{1}{r}u_r - \frac{u}{r^2}\right) - \frac{\sigma\mu_e{}^2 H_0{}^2 u}{\rho} \quad (1)$$

$$uv_r + vv_z = -\frac{1}{\rho}p_z + \upsilon\left(v_{rr} + v_{zz} + \frac{1}{r}v_r\right) \quad (2)$$

where ρ is the density, $\upsilon(=\eta_0)$ is the Kinematic Viscosity, σ is the electrical conductivity and μ_e is the magnetic permeability.

Equation of continuity is given by

$$u_r + \frac{u}{r} + v_z = 0 \quad (3)$$

Maxwell's Ampere equation is

$$(H_z)_{zz} + \mu_e \delta H_0 u_z = 0 \quad (4)$$

Here the infinite porous disks are subjected to uniform fluid suction or injection. The lower disk is subjected to a constant injection velocity of magnitude v_0 and upper disk by a suction velocity of equal magnitude.

There is source strength Q at thecentre $r = 0$ which is given by $\int_0^a 2\pi r u dz = Q \quad (5)$

The boundary conditions for the system under consideration are

$$u(r,0) = 0, u(r,a) = 0 \quad (6)$$

Advanced PWM techniques based CZSI and q-ZSI inerters

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Abstract : **Z- Source Inverter (ZSI) or Impedance Source Inverter (ISI) is extensively used in different field of application like motor drives, electric vehicle and renewable energy conversion.The Z-source concept can be applied to all DC-to-AC, AC-to-DC, AC-to-AC, and DC-to-DC power conversion. One of the main disadvantages of Conventional ZSI (CZSI) is discontinuous input current that hampers the DC supply. This disadvantage of CZSI has been overcome by introducing the quasi-ZSI (q-ZSI). In q-ZSI presence of input inductor makes input current continuous. The performances of the inverter depend on various modulation strategies used to switch the inverter. There exist different types of classical and advanced Pulse Width Modulation (PWM) techniques to switch the traditional Voltage Source Inverter (VSI). Sine Triangle PWM (STPWM), Third Harmonic Injection PWM (THIPWM), Conventional Space Vector PWM (CSVPWM) is the most popular conventional or classical PWM techniques, whereas Bus-Clamping PWM (BCPWM) and Advanced Bus-Clamping PWM (ABCPWM) are the most recent and popular advanced PWM techniques for VSI. In this paper a comparative study between CZSI and q-ZSI have been done for different classical and advanced PWM techniques. The novelty of advanced PWM with respect of classical PWM techniques has been verified by MATLAB/Simulink simulation of CZSI and q-ZSI.**

1. INTRODUCTION

Z- Source Inverter (ZSI) or Impedance Source Inverter (ISI) is extensively used in different field of application like motor drives, electric vehicle, active filtering, UPS, renewable energy conversion [1-8] [12]. There exists prominent research on the different issues on ZSI during the last decade **[1-12].** Topological improvement, ripple reduction, improving voltage gain or boosting factor, better control strategies are the area of research. A conventional ZSI (CZSI) is shown in Figure 1. CZSIhas the unique buck boost capability unlike the Voltage Source Inverter(VSI) or Current Source Inverter (CSI). The X- shape impedance network present in between the DC input source and the inverter power circuit, is responsible for the unique buck-boost capability of CZSI. One of the main disadvantages of CZSI is discontinuity in the input current that hampers the DC supply or grid. This disadvantage of CZSI has been overcome by introducing the quasi-ZSI (q-ZSI). The circuit diagram for q-ZSI is shown in Figure **2.** In q-ZSI due to the presence of input inductor, the input current becomes continuous. Further the q-ZSI topology reduces the voltage stress across the input side capacitor (C2). This q-ZSI is having several advantages, including in some combination with CZSI; lower component ratings and reduced source stress. Like the Z-Source inverter, these inverters are particularly suited for applications which require a large range of gain, such as in motor controllers or renewable energyapplications **[8,12].**

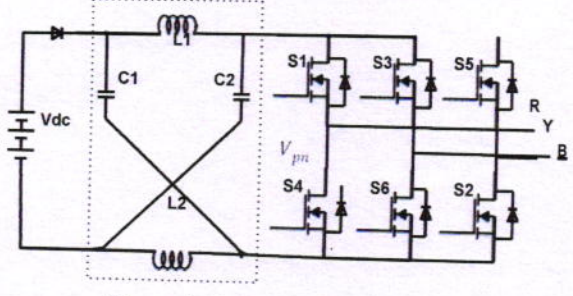

Figure 1. Power circuit for CZSI

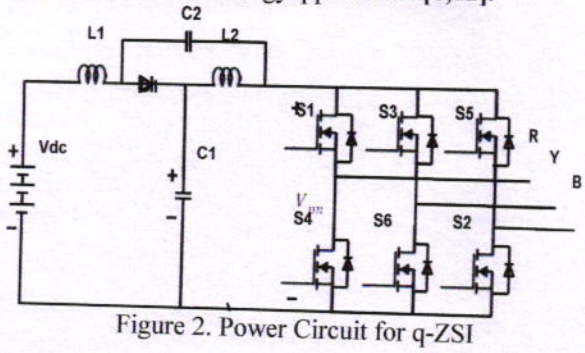

Figure 2. Power Circuit for q-ZSI

In literature, CZSI has been analysed for different control strategies like Simple Boost Control (SBC) **[3][4][6],** Maximum Boost Control (MBC) **[2][5]** and Constant Boost Control (CBC). The MBC gives the highest boosting factor and lowest voltage stress across the switching devices **[2][5].** The MBC can be implemented in carrier based PWM approach or space vector based PWM approach**[9-11].** Extensive study has already been done for carrier based PWM approach for CZSI as well as q-ZSI**[5][13].** The space vector based PWM approach with MBC came in picture in the year of 2012**[9-11].** Further there has a few study of CZSI for Bus ClampingPWM (BCPWM) technique **[9].** BCPWM is one of the advanced PWM techniques.

In this paper a comparative study between CZSI and q-ZSI has been done in the prospective of different classical aswell as advanced PWM technique, like 30^0-Bus Clamping PWM, Advanced Bus Clamping PWM (ABCPWM) technique with MBC. A simulation study in MATLAB/Simulink has been done for same specification for CZSI and q-ZSI. Further application wise what are the difference between CZSI and q-ZSI also studied in this paper.

Rural consumers' scepticism of online shopping

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Abstract

Today the standard of living of human being is discrete. Inhabitants feel uncomfortable for going and consuming more time in busy markets. So E-tail is an advantage as it requires less time and home delivery. On the other hand, it creates havoc among the minds of customer by advertising multiple products. The basic purpose of this study is to observe about the confusions and reluctance of consumer towards online products, its reliability and the way it's laid low with the demographic profile of consumer. Cynicism is an attitude of suspicion that is used here for consumer's response about e-shopping. For this, data analyzed and interpreted by using different tools and methodologies such as chi-square, uni-variate and correlation which are introduced by Spangerbrg and Obermiller. During the study, methods are used for examining consumer preference towards the product and their interest towards shopping online. The outcome of this study shows that the age, gender and academic background of the consumer has influence on consumer's doubt towards the features and facilities of social media. Marketers should understand the interest and problems of the consumer and overcome it with proper counsel and awareness about product quality, features and period ofdeliveries.

Keywords: Consumer; Cynicism; E-tail; Preference; Rural areas

Introduction

Online shopping is nothing but the process where consumers buy products or services directly from a retailer in real-time without any third party service, over the internet. It is the way of electronic commerce. The selling and buying transaction i accomplished by electronic means and interactively in real-time like in Amazon.com for home appliances, electronic gadgets an various fashionable products. Moreover in few cases, some intermediary could also be taken responsible in an extraordinarily buy c sale transaction like the business on eBay.com. E-shopping sites include large mixture of products both high and middle qualit keeping in mind the preference of customer.

1. There are no barriers nationally andinternationally.
2. Customers will be in demanding position according to theirpreference.
3. Suppliers will be ready to fulfill the demand ofcustomer.

An e-shop, e-tail, e-commerce, online shop, smart shop and web store bring to mind the physical equivalence of shoppin for products or services at a tarred and feathered retailer or in a remarkably commercial enterprise. The method is known as Business to-Consumer (B2C) shopping directly. It is quite often called a style of smart business played by companies like Amazon.com an Flipkart.com. Due to this, companies like Amazon.com takes over another business enterprise in order to strengthen their business en into worldwide in online sector with the process of Business to Business (B2B)shopping. A preference of consumer indicates to ho consumer chooses a product or services in respect to factors like taste, preference and individual self concept. In most of the cases the consumer prefers the product or services, it does not matter of his/her income and price of theproduct.

A wide proportion of online business is run completely in electronic form for essential things like entree to premium satisfie on an internet site, but frequently electronic business indulge the shipping of physical items in a way. The retailers who perform thei business in online are called most time as e-tailors and the business is called as e-tail business. Most large retailers are nov positioned their presence internationally in World WideWeb.

Online marketplaces like Flipkart and Amazon Marketplace have significantly reduced financial and reputational barriers t entry for SMEs wishing to trade online. These marketplaces provide web presence, marketing and payment services and, within the case of fulfillment. This permits SMEs to specialize in their core competencies e.g. managing supplier relationships. Moreover SMEs have choices online, as these marketplaces compete with one another (some retailers sell across several marketplaces) and retailers 'own websites. They also compete with paid search providers' et al. in providing marketing toSMEs.

Customer ratings are a key element of the marketplaces, enabling SMEs to make a reputation at low cost relative to the offline environment. This element of reputation may be achieved quickly (just one piece of feedback generates a rating) and is tied to particular platforms (i.e. ratings are non-transferable).

Background of Online Shopping

In 1990, Tim Berners-Lee fashioned the most important World Wide Web server and browser in UK. It initiatd for marketable purpose in 1991. Similarly, in 1994 other advancement become apparent, like online bank and also the opportunity of a

An Indian perspective on hierarchizing fences of health care waste management.

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Abstract :We have not inherited the earth from our ancestors but have borrowed from our children. Mismanagement of this waste is threatening to the environment and to the associated employees like various health care professionals, workers, patients and the general community. Research proves that knowledge about health care waste management (HCWM) will be helpful for authorities to handle and improve its effectiveness. The implementation of grey relational analysis (GRA) has 14 obstacles due to the extent of their negative impact. The two most important obstacles are unauthorized. Reuse of Health care waste and Implementation of "Poor segregation practices". The least important obstacles of HCWM in India are Lack of Accountability of Authorities of health care facilities towards HCWM and Inadequate Awareness and Training framework programs.

IndexTerms **- Health care wastes (HCW), Fences of waste management, health care unit (HCU), Grey Relational Analysis(GRA).**

I. INTRODUCTION

Health maintenance centres such as medical institution and sanatorium centres are growing rapidly in the country so as to mee the preventive requirements of the growing population. Though health care centres inevitably generate waste but ou responsibility is to go in line with achieving the aim of reducing health problems and intensifying the quality of care (Shivalli an Sanklapur, 2014). These waste from hospitals include used human tissues bandages, syringes, and used culture media containin microorganisms(Dwivedi et al., 2009). Unfortunately, it has been a prevalent method by most of the health maintenanc establishments to get rid of these waste in the garbage pail at the roadsides or, low lying area or, direct them into groung wate bodies(Dwivedi et al., 2009;Muduli and Barve, 2012). This variety of unacceptable throwing away of health care waste ma cause rodents and worms, growth and multiplication of insects which in turn lead to the transferral of diseases like HIV ,typhoid Tuberculosis, cholera, Hepatitis B and C(Gupta et al., 2012). These rubbish also constitute a serious damage to the environmen as it is capable of infecting the soil, air and water with harmful metals like carcinogenic gases like dioxin and toxic chemicals lik xylene and formalin, mercury (Dwivedi et al., 2009).

In the scenario of growing level of population and change in their life style, the amount of waste and problems has also increase the numerous in India. Meanwhile, the level of consciousness surrounded by the legislators as well as general public regarding th contagious and unsafe nature of waste has been penetrating. As a consequence, the health care set up in India are involvin tremendous pressure from environmental societies and government to manage their waste properly. Further, few bi establishments are also considering implementation of superior waste management policies as one of their competitive strategie to remain in competition with other heath care establishments. Realization of the negative consequences of poor wast management practices.This could be due to inadequate knowledge regarding the factors those influence HCWM. These influentia factors are mainly of two categories. One those inhibit HCWM practices called the barriers and the other those encourage HCWM adoption known as the enablers. In this research an attempt has been made to explore potential enablers of HCWM. Knowledge o the enablers would be helpful for organizations in formulating strategies to reduce the inhibiting impact of barriers and enhanc HCWM effectiveness in their organizations.

II. LITERATURE REVIEW

In this publications, the terms 'Health care waste', 'Clinical waste', 'Contagious waste' and 'Medical/Hospital waste' are customarily encountered, they may have same meanings or be subgroups of one another, which significantly impedes using and estimating data from different countries (Dwivedi et al., 2009;Hossain et al., 2011). Unacceptable disposal practices of hospital waste not only influences the people who come in direct contact with it but also people staying nearby, hospital staff. It is also responsible for degradation of environment. Few of the adverse consequences of improper HCWM are listed in figure1.

Growing concern regarding health care waste issues have triggered research in this area. Available research on waste management practices in health care quarter has been carried out by various analyzer in countries such as Finland (Ponka et al., 1996)Tanzania(Mato and Kassenga, 1997), The Netherlands (Dijkema et al., 2000), Saudia Arabia (Almuneef and Memish, 2003), United States of America(Lee, et al., 2004; Bernstein et al., 2009), United Kingdom(Tudor, et al., 2005; Blenkharn, 2006), China(Cheng, et al., 2009; Yong et al., 2009). In India, medical waste management examining centers are very less. Most of the Indian hospitals explore harmful impact of improper waste management and status of current practices through case studies(Gupta and Boojh, 2006; Dwivedi et al., 2009;Muduli and Barve, 2012; Patil et al., 2005; Verma et al., 2008; Gupta, et al., 2009).

COAL-SOLAR BASEDHYBRID POWER GENERATION

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Abstract: Coal-fired power operators continue to look for ways to increase the efficiency and extend the working lives of their plants by improving operational flexibility and reducing environmental impact. Two possible options are explored here: combining solar energy with coal-fired power generation, and co-firing natural gas in coal fired plants. Both techniques show potential. Depending on the individual circumstances, both can increase the flexibility of a power plant whilst reducing its emissions. In some cases, plant costs could also be reduced .Clearly, any solar-based system is limited geographically to locations that receive consistently high levels of solar radiation. Similarly, although many coal-fired plants already burn limited amounts of gas alongside their coal feed, for co-firing at a significant level, a reliable, affordable supply of natural gas is needed. This is not the case everywhere. But for each technology, there are niche and main stream locations where the criteria can be met. The need for good solar radiation means that the uptake of coal-solar hybrids will be limited. Co-firing natural gas has wider potential: currently, the largest near-term market appears to be for application to existing coal-fired plants in the USA. However where gas is available and affordable, potential markets also exist in some other countries.

Keywords: coal-fired power plant, coal-solar hybrid, power generation, solar power, co-firing, hybrid

I.INTRODUCTION

Around the world, interest is growing in the sustainable provision of reliable, low-cost sources of energy Increasingly this has prompted utilities to examine alternatives to the fossil fuels that have traditionally provided the bulk of their electricity output. However, many developed and emerging economies continue to rely on coal for much of their electricity. In some, coal-fired power production is operating in an increasingly uncertain marketplace and faces intense competition from other forms of generation such as natural gas, nuclear and
renewable. Set against this background, operators of coal-fired plants continue to look for ways to increase the efficiency and extend the working lives of their plants, often by improving operational flexibility and reducing environmental impact. There are various ways that this might be achieved, two of which are explored in this article: combining solar energy with coal-fired power generation and co-firing natural gas in coal-fired power
plants. The pairing of coal and solar energy may seem an unlikely combination, but under the appropriate circumstances, could offer an elegant solution to combining the reliability and cost- effectiveness Of large-scale coal-fired generation with an emissions freeform of renewable energy. Coal and natural gas seems more 'natural' partnership, and again, there is potential for some coal- fired plants to enhance their flexibility and improve their performance .Fossil fuels such as coal and gas are still vitally important in generating much of the world's electricity, continuing to provide reliable, low-cost supplies. Electricity generated by renewable such as wind and solar is more expensive. Renewable are often heavily subsidized, with Costs passed on to the end-user. The other major drawbacks that most are weather dependent. Hence output is intermittent and can vary widely and in a short space of time. Consequently, other generation systems (such as coal- and gas- fired plants) are needed to provide backup when supply is inadequate or unavailable. Based on data from 26 OECD countries (1993–2013) an estimated 8 MW of backup capacity is required for each 10 MW of intermittent renewable capacity added to a system .Despite these reservations, there are clear incentives to explore options for combining renewable with conventional thermal power plants so that each provides advantages to the other, in the process, creating a cleaner, more efficient generating system. One possible option is to combine solar thermal power with coal-fired generating capacity—so-called coal-solar hybridization.

Coal-solar hybrids

The media sometimes reports on the development of 'hybrid' power projects, although in reality these are often merely co-located generation facilities. For example, photovoltaic (PV) solar cells might be added to a combined-cycle gas turbine (CCGT) plant. Clearly, these solar assets generate electricity, but this is fed into the grid independently of the gas-fired plant. Under this type of arrangement, the solar facility may serve to diversify the economic interests of the plant's owner or reduce the overall environmental footprint of the site, but the PV and CCGT are not as tightly integrated as they might first appear. India plans to install a significant amount of solar PV generating capacity, with some new facilities being located at existing coal-firepower plants. Both will generate electricity that will be fed to the grid independently of the other. Although these two technologies will share a site and some assets such as grid Connection, they will operate largely as independent units and not as integrated hybrids. A limited number of coal-solar projects are true hybrids. These operate under an entirely cooperative arrangement where the two sources of energy are harnessed to create separate but parallel steam paths. These paths later converge to feed a shared steam-driven turbine and generate electricity as a combined force. This form of hybrid technology integrates these two disparate forms of power so that they combine the individual benefits of each .This approach can replace a

PV station for EV-to-Grid application in SM-grids

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Abstract *:* The number and variety of EVs batteries connected to grid continue to grow rapidly, which result in a heavy burden on grid. To solve this problem, it was proposed that electric vehicles could act as a new power source for grid, which is the concept of Vehicle to Grid (V2G). This paper proposed the photovoltaic charging station architecture by using a combination of the Z source boost converter based on the battery charging strategy with the bi-directional PWM Inverter-Rectifier based on the V2G strategy in Smart Grids. In the photovoltaic charging mode, the PV arrays charge the battery by the Z-source boost converter. In V2G mode, the PWM Inverter-Rectifier transfers the active power and passive power according to the grid requirement, thus the EV batteries could be applied for the peak regulation and frequency regulation in grid. Also the EV battery could be used as storage system for renewable power system. The prototype of bi-directional PWM Inverter-Rectifier and Z-source dc-dc converter is developed. Finally, V2G and battery storage experiments are tested. Meanwhile the Z-source dc-dc converter voltage boost experiments are tested. Simulation and experiment results demonstrate that the prototype implements the power bi-directional transformation between power grid and electric vehicles, and the Z-source dc-dc converter achieves the voltage boost. Consequently V2G could significantly increase the smart gird system flexibility, and storage intermittent renewable energy from wind and solar.

IndexTerms **– V2G,PWM Inverter Rectifier, Z-source Converter, PV array.**

I. INTRODUCTION

Electric vehicle has received more and more extensive attention, which is one of the major Development directions of motor vehicles using new energy sources. Electric vehicles are development promising green transports, and important means to solve energy and environmental problems. The construction of charging infrastructure is an important prerequisite for the advancement of electric vehicles. For the last two centuries, the emissions of certain polluting gases caused by human activity have intensified the natural phenomenon known as the greenhouse effect. This phenomenon can have far-reaching consequences on the planet's climate and ecosystems. The international community has therefore mobilized to limit the concentrations of greenhouse gases in the atmosphere, with the goal of reducing emissions by half by the year 2050. With no gas emission, no discharge of particles and a silent operation, the electric vehicle offers an effective and concrete solution to reduce the ecological footprint of transport. It forms the last missing link in the panorama of sustainable urban mobility (train, tram, bus, bicycle) and perfectly matches the needs of drivers travelling short distances of a few tens of kilometers essentially within urban areas. This is the case with private individuals who use their vehicles to commute and also of numerous corporate fleets .Electric vehicle charging station provides power supply for electric vehicles running. They are necessary important supporting infrastructure for the development of electric vehicles. Nowadays the electric vehicles become the topic of discussion on many forums. The problems of designing, operation and other side effects on economy, power systems etc. have not been solved.

1.2Types of Electric Vehicles

Different types of Electric Vehicles (EVs) are being developed nowadays as alternative to the Internal Combustion Engines (ICE) vehicles, namely, Battery Electric Vehicles (BEV), Plug-in Hybrid Electric Vehicles (PHEV), in its different configurations [3], and Fuel-Cell Electric Vehicles (FCEV). EVs are increasingly popular, as demonstrated by the numerous vehicles recently made available in the market by almost all automakers. The main energy storage systems of these vehicles are the electrochemical batteries, the ultra capacitors and the full-cells. However, taking into account nowadays limits of energy storage of those technologies, the vehicles have limited range autonomy. Different energy storage systems configurations can be implemented, however, the electrochemical batteries still are the most used technology to store energy.

1.3 Electric Vehicle charging infrastructure

The demand for charging infrastructure, including charging stations in parking structures and garages is more important as the EVs on the road multiply. A scarcity of charging stations may make EVs less convenient and contribute to range anxiety resulting in less people embracing the use of electric vehicles. Furthermore, if charging infrastructure is available at work, smaller batteries and therefore less expensive vehicles are required to meet consumer's needs . Beyond the physical existence of charging stations, several critical needs must be filled to meet the increasing demand for charging infrastructure, including the grid capacity and the electrical circuits that make charging possible. One solution is charging stations that service multiple vehicles at the same time with a given infrastructure. Multiple parts of the infrastructure need to be shared in order for a charging station to truly service multiple vehicles simultaneously. The charging system needs to share the plug port by safely plugging in multiple vehicles at once, it needs to share the circuit by rationing the available power in order to not overload the circuit, and it needs to share the grid capacity by intelligently scheduling charging in order to avoid peak consumption. To meet this demand, an EV charging system has been developed that safely multiplies the number of EVs that can be connected to a circuit by rationing the power allotted to each EV.

Natural Water Purifier Low Cost Materials

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Abstract
Water filtration has become necessary in most parts of the world due to pollution. The scarcity of drinking water is one of the important challenges faced by human in twenty first century. More than one third of the water available to them is not potable. In a grim reminder that poor quality of drinking water leads to serious health problems, India has admitted that about 180,000 rural populated areas are afflicted by diseases which are caused due to impure, toxic organic and inorganic substances including tri-halo methane, chlorine, etc. Some states have reported multiple contaminations in drinking water and there is no doubt that the current water situation in India will get much, much worse unless suitable solutions are sought. Most existing purification methods not only remove the impurities but drain out the essential minerals as well. Moreover, they are expensive and require extensive maintenance. The study is based on the filtration of water which can meet international drinking water standard. This filtration is done by preparing a filter which can be made by the materials available naturally. The filter material will be economical and everyone can afford the filter due to low cost and easily available of the filter material.Thus a natural filter comprising of bamboo, gravel, pebble and other locally available natural adsorbents is a great alternative to carry out water purification

INTRODUCTION

The cheapest and the most easily available filter material is cloth. Fabric material such as linen, cotton, polyester and other fabrics are typically used in rural areas for filtering water. These clothes are folded into layers to be placed on top of a water pot and water is poured into it to strain out dust and other contaminants. This filter is very cheap but not that effective in removing micro-organisms and chemical contaminants of below 2 microns size.The growth of the global population, the increasing need of water for agriculture and the increasing urbanization putgreat pressure on the existing resources of freshwater andthe finding of news sources of freshwater become necessary. An alternative source of water can be to reusewastewater.The high cost and the insufficiency of centralized wastewater treatment plants mainly in low income countries justify the choice of the onsite filtration system with local and inexpensive filter materials. In this study,bamboo, gravel, pebble, pine bark, powdered cactus, coarse aggregate and sand were used as filter media in column filters.This paper focuses mainly on removal of Fluoride from the water as presence of these chemicals are posing serious threats to the Rural and tribal populations who cannot afford the available costlier techniques. So, it is the need of the hour to introduce the cost effective and efficient method for the removal of the Fluoride from water. In India, 85% of rural water supply depends on groundwater. Groundwater quality may be impaired by many natural constituents such as fluoride, arsenic, iron, nitrate and salinity of which fluoride stands first as a pollutant of geo-genic origin. Chronic exposure drinking water containing high fluoride can result in dental, skeletal and non-skeletal fluorosis.currently there are some defluoridation technologies based on chemical separation, absorption on solid filter media, chemical precipitation and coagulation; Physical separation processes for defluoridation include electro-dialysis, reverse osmosis and Nano-filtration.

Material:

Tulsi: tulsiplant Leavesyield an essential oil containing eugenol, carvacrol, methyl eugenol and caryophyllene. The oil has antibacterial and insecticidal properties. The juice of leaves possesses diaphoretic, antiperiodic, stimulating and expectorant properties. The dried powder of this material will be used as an ingredient in the formation of disc.

Neem: Neem leaves powder was taken for removal of toxic element from water.

Water: Water free from suspended solids need to be used. Although, purity of the water used for mixing will not have much effect.

Clay: There are three essential properties that make clay different from dirt. These are plasticity, porosity,and the ability to vitrify.

a) Plasticity: Plasticity has to be our first consideration.

b) Porosity: Porosity is the second necessary property that clay must have.

c) Vitrification: Vitrification is the third important property of clay. Vitrification is the process of becoming glasslike. although clay products never become absolutely vitrified or glasslike, it is necessary that the clay become hard at a 1200°c.

Activated carbon:

Activated carbon is basically used for two water treatment purposes and each work in totally different ways.

1. Chlorine Removal: Activated carbon may be used to remove chlorine with little degradation or damage to the carbon. De-chlorination occurs rapidly and flow rates are typically high.

2. Removal of Organic Matter: As water passes through an activated carbon filter, organic particles and chemicals are trapped inside through a process known "adsorption". The adsorption process depends upon 5 key factors: 1) physical properties of the activated carbon (surface area and pore size distribution); 2) the chemical makeup of the carbon source

A Study On QoS and Traffic Management by Fuzzy Logic In MPLS Network

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Abstract : This research paper suggests a load balancing algorithm using fuzzy logic methodology so that maximum Quality of Service can be attained. Avoidance of jamming of packets is one of the key performance objectives of traffic management in MPLS networks. Load balancing can avoid the congestion caused due to inefficient allocation of network resources. Another feature of the network performance is Quality of Service (QOS). QOS in telecommunications jargon, is a measurement used to determine how well that network is satisfying the end user's requirements. The Mean Opinion Score (MOS) is an important feature in determining the QOS. MOS is a measurement of the quality delivered by the network based on human observation at the destination end.

IndexTerms **- QOS, MOS, LSP, ABSOLUTE DELAY, E-MODEL, VIRTUAL LINKS, WAN, JITTER, LSR**

I. INTRODUCTION

Trafficmanagementisaprocedurethatimprovesoverallnetworkutilizationbyattemptingtocreateauniformordifferentiated distributionoftrafficthroughoutthenetwork.Animportantresultofthisprocessistheavoidanceofcongestiononanyonepath.It isimportanttonotethattrafficengineeringandmanagementdoesnotnecessarilyselecttheshortestpathbetweentwodevices.Itis possible that, for two packet data flows, the packets may traverse completely different paths even though their originating node and the final destination node are the same. This way, the less exposed or less-used network segments can be used and differentiated services can be provided. In MPLS, traffic engineering is inherently provided using explicitly routed paths. The Label-switched paths (LSPs) are created independently, specifying different paths that are based on user-defined policies. Multi- protocol label switching (MPLS) is a flexible solution to address the problems faced by present-day networks-speed, scalability, quality-of service (QOS) management and traffic engineering. MPLS has emerged as an elegant solution to meet the bandwidth management and service requirements for next-generation Internet protocol (IP)–based core networks. MPLS addresses issues related to scalability and routing (based on QOS and service quality metrics) and can exist over existing asynchronous transfer mode(ATM)andframe-relaynetworks.Avoidanceofcongestionisoneofthemajorperformanceobjectivesoftrafficengineering in MPLS networks. Load balancing can prevent the jamming caused due to inefficient allocation of network resources. Another aspect of the network performance is Quality of Service (QOS). QOS in telecommunications jargon, is a measurement used to determine how well that network is satisfying the end user's requirements. The Average Opinion Score (MOS) is an important factor in determining the QOS. MOS is a measurement of the quality delivered by the network based on human observation at the destination
end.Preciselywecantellaverageopinionscore(MOS)providesanumericalindicationoftheperceivedqualityofreceived media after compression andtransmission.

MULTIPROTOCOL LABEL SWITCHING

In computer networking and telecommunications, Multiprotocol Label Switching (MPLS) refers to a mechanism which directs and transfers data between Wide Area Networks (WANs) nodes with high performance, regardless of the content of the data. MPLS makes it easy to create "virtual links" between nodes on the network, regardless of the protocol of their encapsulated data. The growing number of computer users on the Internet and intranets, as well as new bandwidth intensive applications such as those incorporating voice and video, are driving the need for guaranteed bandwidth and increased network reliability. The typical frame 8520 and packet-based networks lack the quality of service (QOS) and traffic shaping sophistication of the powerful yet expensive ATM networks. Furthermore, the proliferation of network protocols increases the complexity and reduces network capability and performance. In an effort to increase throughput, reduce network complexity in ATM networks, and bring advanced bandwidth shaping and QOS capabilities to non-ATM networks, the Internet Engineering Task Force (IETF) created Multiprotocol Label Switching (MPLS).MPLS combines the power of layer 2 switching with the flexibility and intelligence of layer 3 protocols; it operates independently of other network technologies but is fully capable of interoperating with them. MPLS brings non-ATM networks powerful QOS capabilities, the ability to route multiple network technologies (Ethernet, Frame Relay, ATM) over one infrastructure and the capability of interoperating with modern routing protocols such as RIP, OSPF and BGP, while increasing efficiency and simplifying network organization. Multiprotocol label switching (MPLS) is a versatile solution to address the problems faced by present-day networks—speed, scalability, quality-of service (QOS) management and traffic management. MPLS has emerged as an elegant solution to meet the bandwidth management and service requirements for next-generation Internet protocol (IP)–based backbone networks. MPLS addresses issues related to scalability and routing (based on QOSandservicequalitymetrics)andcanexistoverexistingasynchronoustransfermode(ATM)andframe-relaynetworks.[1]

Fault Tolerance Load Balancing in Cloud Computing

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Abstract: Cloud computing is built upon the advancement of virtualization and dispersed computing to support cost-efficient usage of resources and to provide demand services. The key aim of cloud computing is to afford efficient access to geographically distributed resources by maintaining the property of consistency. However the processing on remote computers creates more chances of occurrence of errors .So there is necessitate of creating error tolerant system to maintain the reliability. This article focuses on maintenance load balancing and enhancing fault tolerance of system by integrating the reactive and proactive approaches of fault management. Our proposed system has been simulated by using cloudsim plus and the simulation result shows that the reliability and fault tolerance has enhanced.

Index Terms: Load balancing, fault rate, cloud computing, reliability, fault tolerance

I. INTRODUCTION

Cloud computing paradigm has been widely adopted due to the growing demand for litheness and scalability in vigorously obtaining and releasing computing resources in effective and device-dependent manner. It helps in hosting application without burden of setting up and maintenance. The increasing popularity of this concept has the importance of its accurate and continuous operation in the existence of defective components which is an attractive substitute to standard information processing system. Among the many addressable issues of cloud computing such as workflow scheduling, fault tolerance, security, load balancing is one of the important issue which the researchers are supposed to look forward.

Load balancing is the practice of distributing workloads and computing assets to develop the performance of system. It allows the users to manage demands of appliance or workload by allocating assets among networks, multiple computers or servers. Load balancing concern the allocation of resources among the users in uniform manner so that no node is congested or sitting idle. The major goal of load balancing in cloud computing is to maximize throughput, attain maximum resource use, maximize fault tolerance, minimize reply time and stay away from overload.

Load balancing algorithms are categorize as static, dynamic or mixed scheduling algorithms based on their natural history in conventional distributed computing and grid computing environments [1] where (a) Static Load Balancing Algorithm is appropriate for dispersed environments with high Internet speed and ignorable communication delays (b) Dynamic Load Balancing Algorithm suitable for bulky distributed environments focuses on dropping communication delays and execution time and (c) Mixed Load Balancing Algorithm focuses on balanced distribution of assigned computing task and reducing communication cost. Based on above classification, cloud computing falls under second category which means balancing load in cloud computing atmosphere requires focusing on dynamic load balancing algorithms. The benefit of using dynamic load balancing is that if any node fails, it will not stop the progress of the system; it will only affect the system performance. The effectiveness of load balancing [2] algorithm depends on performance of the parameters like reliability, fault tolerance, adaptatibility, resource utilization, migration time, response time, scalability etc.

The leftovers of the paper are structured as follows. The section II represents the related work done in proposed research area. Section III describes the proposed model. Implementation details and results have been defined in section IV. Lastly concluding remarks and future work has been given in section V.

II. RELATED WORK

In [3], proposed load balancing algorithm which balances the load on the host and conserve the fault tolerance stage of the method on the basis of virtual migration. [4]Based on Virtual migration, Wilcox projected a load balancing proposal named as modified central scheduler load balancing (MCSLB), which migrates from the heaviest load host toward the lightest host. In [5]Wang et al.,

HYBRID POLYMER (PLA) LAMINATED COMPOSITE PLATE WITH INTERNAL DELAMINATION FREE VIBRATION ANALYSIS

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Abstract :Composite materials are widely used in the industries such as marine, automobile, aerospace, civil, aviation, etc. Because of their excellent mechanical properties also for light in weight and easily mould in any shapes and size as per requirement. The present study focuses on Numerical analysis the test plate is made from Polylactic Acid (PLA) polymer and Glass fiber. Exhibits low to no warping, enhanced physical properties such as high rigidity, strength and good surface finish similar to ceramic. Glass filled PLA is designed for use with 3D printing processes with a raft. . But one of the serious defect occur in the laminated composite plate is delamination. However, composite laminates are prone to delamination, which may not be visible externally, but can substantially affect the performance of the composite structure. Free vibration analysis of a laminated plate with delaminations is presented using a layer wise theory. Equations of motion are derived from the Hamilton's principle, and a finite element method based on the first order shear deformation theory is developed to formulate the problem. The results of this research are useful for detecting delamination in multi-layer composite materials. It was shown that the different mode shapes of the frequency of the plate increases if the delamination areaincreases.

***IndexTerms*- Delamination, hybrid laminated PLA composite plate, Free Vibration, natural frequencies.**

I. INTRODUCTION

Composite materials have been generally used to enhance the execution of different sorts of structures. Contrasted with traditional materials, the primary points of interest of composites are their better firmness than mass proportion and also high quality to weight proportion. On account of these focal points, composites have been progressively fused in basic segments in different modern fields. A few cases are helicopter rotor cutting edges, airplane wings in aviation design, and extension structures in structural building applications. A portion of the fundamental ideas of composite materials are examined in the accompanying segment to better familiarize ourselves with the conduct of composites.

Now days, the widely used material in industries is composite material for their excellent mechanical properties. They are known for their incredible lightweight, stiffness to weight and strength to weight ratios. We can achieve difficult structures, complex shape or design with the help of composite material. But the common mode of damage is occurring in composite material called as delamination. Delamination is nothing but separation of two layers of composites. Delamination occur in composite plate is invisible because it occur inside of the material.

Delamination also develops due to repeated cyclic stresses, manufacturing defects, low velocity impact, unlike environment condition. Due to delamination in composite plates may reduce mechanical properties such as loss in strength, toughness, stiffness, and material unbalance. Therefore detecting such type of damage the nondestructive test are used for composite and to solve such type of problem by using various approximate techniques in which finite element method can be used by using software ANSYS 15.0 for damage monitoring of laminated composite plates. Composite materials are the versatility in their properties which enables them to be applied in large number of fields. Other reasons are their light weight, corrosion resistance anddurability.

Composite materials are used in large number of vast engineering fields such as aviation, automobile and robotics. The metals are equally strong in all directions, but the composites can be designed and engineered to be strong in a specific direction. Thermoset Composites give designers nearly unlimited flexibility in designing shapes and forms. Because thermoset composites can be precisely moulded, there is little waste and therefore significantly lower overall material costs than metalsproducts.

II. DELAMINATION IN COMPOSITESTRUCTURES

Fig.1.1. Delamination of CRPF under compression load

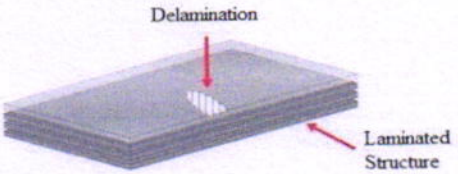

Fig.1.2. Delamination of a Laminated Structure

CASCADED ACTIVE FILTER IMPROVEMENT OF VOLTAGE PROFILE IN AN ON-GRID PV-SYSTEM

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Abstract **:**Voltage fluctuation and harmonics in voltage has been most significant issue since the inception of renewable energy system into the grid network. Besides this the fluctuating pattern of load also makes worse the voltage profile. Under such a situation use of custom power device in the form of Cascaded Active Filter becomes the answer to the problem. The main objective of this work is to improvise the voltage profile through Cascaded Active Filter implementing Sinusoidal current control strategy. The strategy is a time domain control strategy based on instantaneous p-q theory. The control strategy has been elaborated here in details and has been implemented using MATLAB 2016A. The results have been given and described in details explaining efficacy of the above control strategy. Since sinusoidal current control strategy is a simple and effective control strategy it has tremendous potential for application in the Distributed Generation oriented system.

IndexTerms - Cascaded active filter, Power quality , sinusoidal current control strategy

I. INTRODUCTION

Most utilities have certain assumption that central generation utilities should produce pure sinusoidal voltage. Voltage variation percentage is less in the transmission system and should kept its rating(Voltage, current, power factor) under certain specific limit which is usually not a big issue for power quality problem. But when we consider distribution systems due to unbalancing in three phase circuit, the voltage fluctuations are noticeable. Moreover at several instants only, the current waveform found to be a pure sine wave. This oddity gives a new concept to electrical sector i.e. *harmonics,* which leads to deterioration of power quality and efficiency of recent electrical power system.

The followings are the main causes of voltage related issues.

1. Microprocessor and Microcontroller-based faster islanding and isolation.
2. High-efficiency adjustable-speed motor drives raising the level of harmonic over power systems.
3. Deregulation of utilities with reduced awareness of harmonic control and lower reliability.
4. Highly interconnected network, where the failure of any component jeopardizethe system stability.
5. Introduction of Distributed Generation (DGs)

For the sake of productivity and profitability of consumer, machinery which are most efficient and productive are used which are driven by semiconductor devices. This may cause several issues on power quality which are not tolerable. The installed machineries and equipments are affected severely and they are becoming the source of real power quality issues. During the entire processes of automation, the competent operation of machineries and their control moreover depends on the quality of power.

The traditional distribution system passes the electrical energy from an individual source of power to multiple loads. In the present scenario with the increase in demand, the DGs are integrated with the traditional distribution system. The DGs use smaller-sized generators as compared to the exemplary central power plants and are scattered throughout the power system adjacent to the loads. Now, the DG has evolved as more crucial to figure out the assimilation of these systems by the interaction of power electronics with the current power system circuitry. As the DG operations are controlled through the use of power electronic devices, the excessive use of these controllers result in severe PQ issues. Hence implementation of multiple DG sources with the traditional system may lead to the severity of PQ issues.

II. POWER QUALITY

Power Quality (PQ)- The term in power system now in trending as it's a huge problem for both supply end and mostly for receiving end. Most consumers are now demanding quality and uninterrupted power because they are aware of recent power quality issues and they are ready to give the cost for the qualitative power.

By considering different aspects of reference(Utility or consumer) PQ can be defined. From utility point of view power quality means reliable power and from manufacturer of load point of view PQ means equipment which can sustain and work properly in such type of quality power. But pertaining PQ as a consumer driven issue, it may be defined as to suit the end users: Any power issues manifested in voltage, current or frequency deviations that results in failure or malfunction of customer equipments. However we cannot defined PQ by considering manufacture end and utility end individually but eventual measure of PQ may be classified on the performance and efficiency of consumer side equipments [1].

The PQ puts the boundaries of the deviation levels of voltage, frequency and waveform shape of power supply for the proper functioning of the equipment. Though day-by-day the power electronics devices are making the system compact and reliable, these are the primary cause of the production of harmonics in the system. The use of such kind of filters shields electrical apparatus which can be exaggerated by deprived/low PQ and avoids the propagation caused instabilities in the power systems. Many control strategies have been realized, out of which the most effective is sinusoidal current control strategy. for mitigation of the harmonics and also others PQ issues as generated due to unbalanced or unstable system owed to the non-linear loading condition.

Complex Formation Equilibria of Transition Metal Ions (Fe (II), Co (II), Ni (II), And Cu (II) Studies with Folic Acid

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***Abstract* :Research of metal complexes with biologically active ligands is one of high scientific and practical interest. The proton-ligand and metal-ligand stability constants of the complexes of Fe(II), Co(II), Ni(II) and Cu(II) with folic acid have been determined by pH-metric method in medium of 20% acetone-water mixture at ionic strength 0.1M $NaNO_3$ solution and 30 ± 0.1 °C temperature. Proton ligand stability constant ($\log K'_H$) of folic acid is determined by Irving-Rossotti Method. Ligand metal stability constants (log K_H) of metals Fe^{2+}, Co^{2+}, Ni^{2+} and Cu^{2+} were calculated at 303K. The order of stability constant for metal complexes by Irving Rossotti Method, follows the order $Fe^{2+} < Co^{2+} < Ni^{2+} < Cu^{2}$.**

I. Introduction

Metals are commonly found as natural constituents of proteins, vitamins, enzymes etc. Nature has learned to use the special properties of transition metal ions to perform a wide variety of specific functions associated with the processes. In the formation of metal complexes or metal coordination compounds, transition metal possess a distinctive property. The complexes which acquire dissimilar physicochemical properties are formed by the metal ion coordinated with a mixture of molecular species. In order that they have wide applications in metal extraction, water purification and medicines etc. Folic acid is used in the treatment and prevention of folate deficiencies and pernicious anemia. The absorption of metal-folic acid complexes as drugs are higher than the folic acid itself.

It is essential to measure the stability constant for calculating quantitatively the concentration of free metal ion, ligand and the complex formed in the system, under unusual conditions of pH. Recently, there has been considerable interest in the study of binary and ternary complexes by pH metric method[1-6]. So, attempt has taken to measure the stability constant of transition metal ions with folic acid.

RESEARCH METHODOLOGY

The solutions used in potentiometric titration were prepared in double distilled water. The stock sodium hydroxide solution was standardized by potassium hydrogen phthalate using phenolphthalein as indicator (0.2M) and standard alkali solution was again used for standardization of prepared nitric acid solution. Sodium nitrate solution was used to maintain ionic strength. The pH of the solution was measured by an Electronics India digital pH meter (model 101) set with a reference calomel electrode and magnetic stirrer. The pH meter was calibrated at pH 4.0, 7.0 and 10.0 using the standard buffer solutions before titration. The iron, cobalt, nickel and copper salt solutions were standardized by the reported method. The activity of H^+ was converted to the concentration of hydrogen ion using activity coefficients calculated from Davies equation. All the measurements were done at room temperature 303 K.

At the time of titration, pH measurements made with alkali solution of ligand in the presence and absence of metal ion. According to Calvin and Wilson[7], these pH values could be used to evaluate the formation functions ($\bar{n}_A$, $\bar{n}$ and ρL) and stability constants. Using Irving Rossotti method, the following solutions are titrated against standard sodium hydroxide solution (N^0) keeping total volume (V^0) constant.

(a) HNO_3 (A)
(b) HNO_3+ Folic acid (A + L)
(c) HNO_3+ Folic acid + Metal ion (A + L + M)

Total initial volume = 50 ml, ionic strength (I) = 0.1, [NaOH] = 0.14 M, [H^+] = 0.1 M **(Fig. 1)**

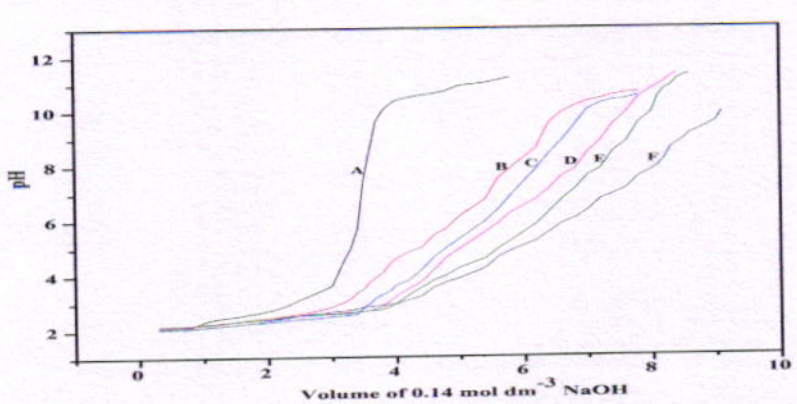

Figure 1 Plot of pH versus volume of NaOH

OPTIMAL ENERGY MANAGEMENT AND IMPROVED BATTERY LIFE SPAN WITH RENEWABLE BASED DCMG

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Abstract:
Now a day, renewable energy is the best form of clean energy due to high penetration of solar and wind energy. Smart grids are the future grid of the common utility grid due to one way power to the different plants to the large number of consumers. In the upgrade system we can integrate renewable energy system to the grid and manage the power supply to every consumer in a smart way. The main challenging task is to storage of energy stability and co-ordinate control of power in large scale. In this smart grid there is a new technology used i.e the two way communication and transmission of information between all parts of the grid. In this technology the problem occurred in a certain section can be detected in fasterway.[1]

I.INTRODUCTION:-
The modern world and its growth needs new ideas to sustain, thereby encouraging innovation. Evolution of science is like a boom to the world. Science technology and management have brought tremendous advances around the world. Here all three components science, technology and management are co-related to each other [2][3]. When science is discovered then a new technology is invented and that technology manages a countries Economic growth and development. Science- Technology-Management are very important variables for long run economic growth. In present days smart grid is the new innovation. We need the smart grid for the bellowregion:-

- The conventional grid is having are way communication. But smart grid uses two digitalcommunications.
- The conventional grid uses centralized generation and smart grid uses distributedgeneration.
- The conventional grid will have limited sensors where as smart grid is equipped with sensorsthroughout.

II.BATTERY STORAGE MANAGEMENT AND OPTIMIZATION MODEL:-
The steady production of power by the huge power station is presented in our ongoing energy system. In normal grid the power supply is not dependent on the weather conditions as we know in winter season a consumer consumes less electricity then in summer season but we can supply same amount of electricity in both the seasons, due to this reason loss of energy occurs. To evacuate this problem we use storage system in smart grid[4][5]. The sustainable sources like coal and gas will be replaced by the imperishable wind and solar. An important bottleneck of sustainable energy is its fluctuating supply, which rarely runs parallel to demand to overcome this problem the only one solution is storage but it is not an easy one now a days. The way we use to store energy is costly. So we have to develop a new technology to store the energy. The stability of the electric power grid is maintained through real time balancing of generation and demand[6][7]. Grid scale energy storage systems are increasingly being deployed to provide grid operators the flexibility needed to maintain this balance. Energy management systems (EMSs) and optimization methods are required to effectively and safely utilize energy storage as a flexible grid asset that can provide multiple grid services.

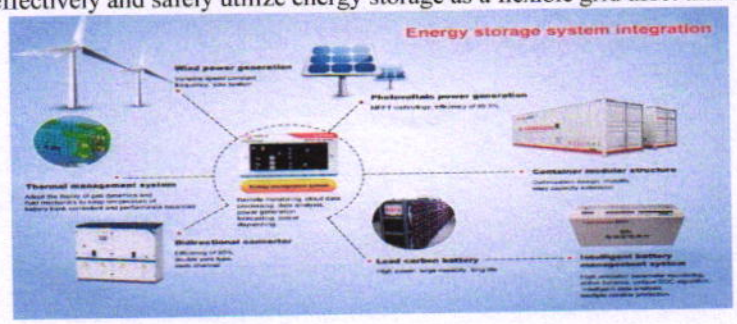

Figure 1. Generalized structure of Renewable based Grid.Ref.[1

OPTIMIZATION STRATEGIES IN A COST EFFECTIVEMANNER:-
In smart grid the storage is the main thing which is more costly in this project. It is costly because we have to use more number of batteries to store the energy. If we optimize the number of battery or we can use a new technology to store the energy the cost will be optimized [8][9]. If we use solar and wind in place of coal and gas to generate electricity we can optimize the cost.

14-membered TETRA-AZA-N4 macrocyclic complex: Synthesis, Spectral Characterization, and Antibacterial Evaluation

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Abstract : The main objective of this study was to synthesize and characterize a series of tetra-aza macrocyclic complexes of the divalent transition metal ions Cr(III), Co(II), and Cu(II) derived from the template condensation of ethylene diamine and diethyl malonate as locking agents. The corresponding metal salts were taken as $Co(NO_3)_2.6H_2O$, $Cr(NO_3)_3.9H_2O$ and $CuCl_2.2H_2O$ in 99.9% ethanolic medium. Characterization methods like XRD, FTIR and UV-Vis spectroscopy have been deployed to study the synthesized complexes. The molar conductivity, magnetic susceptibility, melting point and solubility determination measurements give supportive evidences for the possible formation of the proposed octahedral and tetragonal geometry for these complexes. The values of molar conductance obtained in DMSO for these complexes are low and indicate their non-electrolytic nature. Furthermore, x-ray diffraction study reveals that the prepared complexes have octahedral geometry, with metal ion occupying the center of an octahedron. The antibacterial property of these complexes was also investigated against different bacterias (gram positive and gram negative) which indicated maximum inhibitory property for Cu(II) complex.

Index Terms **Macrocyclic complex, Molar conductance, XRD, spectroscopic analysis, Magnetic Susceptibility, Antibacterial study**
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I. INTRODUCTION

Macrocyclic transition metal complexes have shown their effectiveness in diverse field of research and application. This leads to extensive study of the chemistry of macrocyclic ligands and their complexes in recent years [1, 2]. Macrocyclic complexes derived from ions of transition metals with organic/inorganic ligands have attracted the precious attention of chemists due to their versatile applications in catalysis, bioinorganic and supramolecular chemistry. These complexes can attain unusual oxidation states of a metal centre as well as high thermodynamic stability leading to such applications [4-7]. Currently, the synthesis and study of macrocyclic complexes is an emerging field of research due to their use in medicine. Various naturally occurring and artificially manufactured macrocyclic compounds have shown great potential in chemical and pharmaceutical industry as metals play a vital role by forming chelate material. Due to this, template reactions for synthesizing macrocyclic metal complexes have been widely used. Here, the templating agent is a transition metal ion [7].

In this study, synthesis of cobalt, chromium and copper macrocyclic complexes have been carried out. The structural, optical and biological characterizations of these complexes have also been performed. Physicochemical techniques of different kinds are used to study these complexes.

The ligands and their metal complexes show good antibacterial and antifungal properties as these are screened against the strains of various bacterias. The antimicrobial performance of the ligands/metal complexes were also analyzed against microbes like *E. coli, B. subtilis, P. aeruginosa and S. aureus*.

II.RESEARCH METHODOLOGY

a. Synthesis of Cobalt (II) complex

Synthesis of [Co(II)$(en)_2$DM.] was carried out by the addition of 2.9 g (0.01 mol) of diethyl malonate (DM) in 50 mL of ethanol and 1.70 g (0.01 mol) of Co(II) chloride was added to it . This reaction mixture was subjected to condensation reaction for 8 hour at 50 °C. After that a brown precipitate of Co(II) complex was collected with filtration and washed with agents like ethanol and diethyl ether. The sample was air dried and obtained yield of the product was 59%.

b. Synthesis of Chromium (II) complex

Synthesis of [Cr(III)$(en)_3$DM] was carried out by the addition of 2.98 g (0.01 mol) of diethyl malonate DM in 50 mL of ethanol and 2.42g, (0.01 mol) of Cr(III) nitrate of was added to it. This reaction mixture was constantly stirred for 10 hours at 55 °C. A light pink coloured precipitate of Cr(II) complex was obtained. The obtained sample was collected with filtration and washed with agents like ethanol and diethyl ether. The sample was air dried and the obtained yield of the product was 61%.

c. Synthesis of Copper (II)complex

Synthesis of [Cu(II)$(en)_2$DM] was carried out by the addition of 2.98 g (0.01 mol) of diethyl malonate in 50 mL of DMSO and 2.81 g (0.01 mol) of Cu(II) chloride was added to the mixture. This reaction mixture was subjected to stirring for 8hour at 60 °C. After that a bluish green precipitate of Cu(II) complex was collected with filtration and washed with agents like ethanol and diethyl ether. The sample was air dried and the obtained yield of the product was 63%.

A REPLACEMENT FOR COARSE AGGREGATE IS REACTIVE POWDER CONCRETE

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Abstract : This dummy run was performed to study the functioning of Reactive Powder Concrete (RPC) with different materials . The constituents of reactive powder concrete used in this analysis are cement (ordinary Portland cement), crushed quartz sand powder, fine aggregate (sand), silica fume , steel fiber and super plasticizer with low water to cement ratio with no coarse aggregates. Experiments were carried out to analyze the productive substitution of coarse aggregate by steel fibre to attain ultra-high strength concrete. The impact of quartz powder, silica fume and other admixtures to enhance the rupture properties of the RPC mix, is studied in addition to the normal water and hot water curing method to achieve higher compressive and flexural strength.

Index Terms **- Reactive Powder Concrete, micro silica, steel fiber, pozzolana**

I. INTRODUCTION

Reactive Powder Concrete (RPC) is a advance composite material that will allow the concrete industry to optimize material use to gain economic benefits and build structures that are strong, durable and sensitive to the environment.

High-Performance Concrete (HPC) is a simple mixture of cement, water, and aggregates. It contains mineral components and chemical admixtures having very specific characteristics, which give specific properties to concrete. HPC has achieved the maximum compressive strength in its existing form of microstructure. However, at such a level of strength the coarse aggregate becomes the weakest link in concrete. In order to increase the compressive strength of concrete, the coarse aggregate is removed. This philosophy has been employed in Reactive Powder Concrete.

Reactive Powder Concrete (RPC) was developed in France in 1990s and the world's first Reactive Powder Concrete structure, the Sherbrook Bridge in Canada was erected in July 1997[16]. It is an ultra high strength and high ductility cementious composite with advanced mechanical and physical properties. In this concrete the microstructure is optimized by a specified gradation of all particles in the mix to yield maximumdensity.

Reactive powder concrete (RPC) is a generic name for the class of cementitious composite materials developed by the technical division of Bouygues, S.A. in 1990s. It is characterized as excellent physical properties, more strength and high ductility. Table 1 gives the properties of RPC with those typically associated with conventional high performance concrete. While RPC is considerably more expensive to produce than regular concrete, more isotropic in nature and greater ductility make it competitive with steel, over which it has a significant cost advantage for many structuralapplications.

II. OBJECTIVE

The main objective is to study the compressive and flexural strength behavior of RPC with varying compositions of materials in our environment and to achieve the maximum possible strength This included demonstrating that a quality product could be obtained with local constituent materials and establishing an independent benchmark of the performance levelsachievable.

III. COMPOSITION OF REACTIVE POWDERCONCRETE:

It consist of fine particles to achieve excellent mechanical behavior, higher strength & greater durability. The mix include high amorphous micro silica to escalate the hydration of cement and initiate a strong pozzolanic reaction effect. Super plasticizers and superfine silica fume and quartz are added to attain low water/binder ratio to reduce porosity and increased strength. Steel fiber is introduced to enhance ductility of composites. Coarse aggregates are replaced to gain homogeneity of concrete mix.

Review Reports on Cyber Security User Authentication Techniques

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Abstract: The Internet has merged itself as an extremely ground-breaking stage that has changed the correspondence and business exchanges. Presently, the quantity of clients exploring the Internet is more than 2.4 billion. This enormous group of spectators requests online business, learning sharing, informal organizations and so on, which became exponentially in the course of recent years. Accordingly, it prompts the requirement for security and improved protection. As of late, misrepresentation over the Internet comprises one of the fundamental disadvantages for the across the board of the utilization of business applications. Along these lines, the three imperative security issues occur each day in our universe of straightforward design, even more decisively: recognizable proof, confirmation and approval. Distinguishing proof is a procedure that empowers acknowledgment of a substance, which might be either, a human, a machine, or another advantage, for example, a product program. In security frameworks, validation and approval are two reciprocal systems for figuring out who can get to the data assets over a system. Numerous arrangements have been proposed in the writing, from a straightforward secret phrase to late advancements dependent on RFID (Radio Frequency Identification) or biometrics. This paper gives an outline on existing verification techniques, and its upsides and downsides when planning online assistance.

Key words: Information technology, user authentication, online services, cryptography, biometrics.

INTRODUCTION

As far back as two decades, PC frameworks have created at a risky rate. In a wide extent of conditions, such frameworks have transformed into a significant contraption. Affiliations are building frameworks with greater scales than at some other time, and the system with the overall Internet has ended up being fundamental. Nearby this example has come an impact on the usage of PC composes as a strategy for illicit access to PC structures. The web is known as a historic stage that changes the way wherein we grant and perform business trades in current advancement [1]. It has now reached each piece of our lives nearby ascending of additional cutting-edge security risks, arranged to leave towards the experience of annihilations. As shown by the Internet World Stats, as of June 30, 2012, over 2.4 billion customers are using the Internet, and accordingly the numbers no vulnerability will keep growing. Thusly, the presence of information assurances has changed our lives particularly with the information that is available, whereby data can without quite a bit of a stretch be gotten to and controlled [2]. Transmitted information level is twisting up logically huge especially as correspondences that used to simply be finished disengaged, for instance, bank and business exchanges are by and by being done online as Internet banking and electronic business exchanges, and damages on account of such attacks will be increasingly conspicuous. As extending proportions of individual information are surfacing on the Web, it is essential to remain cautious about the threats incorporating the straightforwardness wherein our private nuances can be gotten to. Relational collaboration and online profiles add to this: giving potential gatecrashers a lot of delicate information [3-4]. Insafe reports that more than a fourth of children in Europe have web frameworks organization profiles, which can be revealed, and within excess of 900 million people on Facebook alone, the hazard is expansive.

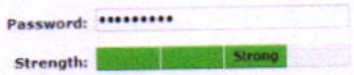

Figure: 1 Password showing strong strength

TOWERS WITH VERTICAL GROWTH AND SUSTAINABLE SOLID WASTEMANAGEMENT IN URBAN AREA

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Abstract: In this era of rapid urbanization and limited land, growth is running vertically in the sky touching towers.Creating space in the form of apartments for families and looking after the basic amenities is the need to sustain the rising population. Solid waste is an important issue in this rising population. Collection, transportation, treatment,recycling,reusing and upcycling of solid waste is a concern for all stakeholders including builders, residents, garbage collectors, garbage contractors, government officials besides our natural flora and fauna. Development is the demand however Sustainable Development is the concern. Present solid waste management programs should not only sustain the vertical growth but also be equipped enough to harness the huge amount of by-products generated through structured solid waste management. Innovative, economical and sustainable processing of solid waste and using its by-products is required. Here it has been tried to highlight why solid waste is a menace and how this menace can be effectively managed through various modern technologies like clean energy production from biomass, installation of the heat recovery system, reuse and recycle plastic waste, units for conversion of bio waste into an up cycled sustainable bio-based material substitute and Carbon up cycling technologies (CUT).

Keywords: *Biowaste;Carbonupcyclingtechnologies; Influential factors sustainable development; Solid waste management; Vertical growth.*

I. INTRODUCTION

Rapid concretization and extensive vertical population rise of the Delhi NCR area are mind boggling concerns in sustainable development. Solid waste management and vertical growth of the city are not sinking together with an idea of sustainable development. Unsustainable population in high rise towers is contributing to massive accumulation of garbage around the city and water bodies which are running parallel to Delhi, Noida, Greater Noida, Ghaziabad, Faridabad, Greater Faridabad area.[1] A large area is being cleared to raise the concrete forest. Builders construct high rise buildings with unconcerned planning or partial estimation of waste generated and their management at source and sink. The vertical population that is taking over these towers is unaware of the lethal concern on the environment to be followed by their occupancy in these apartments. The situation is already alarming. There is a need for a structured scheme of waste disposal and its proper execution. Awareness about the problem is also equally important. This should no longer be limited to handful of aware environmental enthusiast but should be seeded in mind of present society,one and all stakeholders. [2]

SOLID WASTE A MENACE

The city is growing vertically as we talk of long towers however waste management is not even enough for horizontal expansion. We can easily trace trails of exposed solid waste as we pass through lanes and boundaries of habitation in and around Delhi NCR region. Municipal Corporations needs to be equipped to handle and effectively manage the large quantum of waste generated per day in vertically growing cities. The evident proof of improper waste management is untreated waste is seen openly dumped. [3]

The sources of wastes are from residential, commercial, institutional, municipal corporation services. If we talk about residences it ranges from independent houses to flats, apartments, farm houses. Commercial includes from departmental stores, hotels, large supermarkets, malls, offices. The institutional waste is from schools, colleges, hospitals, government establishments and municipal corporation services generate waste when the streets, public areas are cleaned up. [4]

What kind of perishable and non-perishable materials are generated? It comprises from food waste, paper, cardboard, plastic, clothes, metal, glass, wood, electronics, special wastes, bulky items, leaves, hazardous wastes, construction debris and other discarded materials.

It is the onus responsibility of all the Municipal Corporation to manage Municipal Solid Waste, which is the by-product of modern lifestyle but the fact is that it is outgrowing urbanization. The data is very startling. A decade ago, it was recorded; 2.9 billion urban occupants generated about 0.64kg of MSW per person daily. Now, the latest record shows, 3 billion people are generating 1.2 kg per person every single day. It is estimated that, by 2025, it will be increased to 4.3 billion residents generating 1.42 kg of Municipal Solid Waste. [5]

To obtain quantitative information and to conduct analysis, two major scientific journals, Waste Management Journal and waste Management and Research took the initiative. The main objective of this research was to understand the stakeholders' action or behaviour which play a significant role in the waste management process and understand various other factors which are the influential factors. It was accounted from 22 developing countries in 4 continents. The source was collected from scientific literature, available data bases, objective observations made during the site visits, formal interviews with the people concerned, through participants of workshops and questionnaire shared with stakeholders. The information gathered from all these sources gave a strong valid base to understand the real reason for the systems' failure and it helped in planning, changing

Diabetes Mellitus Classification – An NN-SVM Based Approach

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Abstract *:*This study proposes the prediction and classification of Diabetes Mellitus using supervised learning methods like Artificial Neural Network (ANN) with Scaled Conjugate Back propagation algorithm and Support Vector Machines (SVM). The network is trained by using the data of 100 individuals with mean age of 42 years having an equal proportion of male and female. The objective is to compare the performances of the machine learning approaches. The performance of each algorithm is further discussed on the basis of accuracy and validates accurate prediction.

***IndexTerms*- Conjugate Gradient, Structural Risk Maximization, Support Vector Machine, Radial Basis Function, Back Propagation**

I. INTRODUCTION

Diabetes is fast gaining the status of the potential epidemic in India with more than 62 million diabetic individuals currently diagnosed with the disease [7]. The prevalence of diabetes is predicted to double globally from 171 million in 2000 to 366 million in 2030 with the maximum increase in India [11]. Evidence suggest that many factors affect the prevalence of the disease like genetic factors, obesity and change in lifestyle [11]. The chronic disease imposes a large economic burden on health care systems and currently there is no evident cure for this disease [11]. A classifier should be designed with optimal cost and maximum accuracy for the detection of diabetes. Early detection of diabetes has attracted significant research interest. Detection and diagnosis of diabetes at an early stage is the need of the day.

A classifier is required and needed to be designed that is cost effective, efficient and accurate. This problem is chosen because diabetes has now become a major public health concern associated with increased morbidity, mortality and cost of health services. Therefore,machinelearningtechniqueshavebeenconsideredtodesignautomaticdiagnosissystemfordiabetes.Machinelearning approaches have increased the efficiency to numerous problems in various domains and has therefore gained popularity. Artificial NeuralNetwork(ANN)andSupportVectorMachine(SVM)formsagoodmeansoflearningfromthepastdataandgeneralisesthe learnedfeaturesintotheunknowninputs.TheproposedmethodusesANNandSVMasaclassifierfordiagnosisofdiabetes.

The paper is organized as follows: In section 2 we discuss the data set collection and methodology of the approaches used in our study that is ANN and SVM. In Section 3, we review the results that are obtained from the used approaches. Section 4, we describe the limitations of our approach, finally in Section 5, conclusion and suggestions for future research are provided.

II. RESEARCHMETHODOLOGY

III. 2.1 Dataset:

Data from one hundred individuals were collected from the local inhabitants of Bhubaneswar, Odisha (India). The data consisted of 6 variables and the individuals comprised of both male and female between the age group of 21-71 years. The data was trained to identify the diabetes pattern in the individuals. They were asked to fill up the Questionnaire (See Appendix A) to predict the occurrence of diabetes with the given symptoms. The description of the input and their linguistic term is shown in Table 1.

Table 1. Description of input variables and linguistic terms

Input	Linguistic Term
Age	Adult, Middle Aged, Elderly, Old Aged
Body Mass Index	Normal, Overweight, Obese, Extreme Obese
Diastolic Pressure (mg/dl)	Low, Normal, High, Very High
Diabetes Pedigree Function	Yes , No
Plasma Glucose Concentration (mg/dl)	Low, Intermediate , High ,Very High
Suffering Diabetes	Yes, No

Multilevel Inverter Interfacing of PV Resources with the Utility Grid

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Abstract:Multilevel (means Staggered) inverters have been pulled in to the scholarly community just as industry in the disdain decade for high-voltage and medium-voltage control. Furthermore, they can assemble waveforms by exchanging with lower levels of consonant contortion contrasted with a two-level proportionate transformer. A staggered idea is utilized to diminish symphonious bending in the subsequent waveform without lessening the intelligent force yield. This paper shows the most significant topologies, for example, a diode reflector (impartial point tensioned), a fixed capacitor (flight capacitor), and staggered successive with independent DC sources. This paper likewise exhibits the most important adjustment strategies produced for this arrangement of transformers: staggered sinusoidal heartbeat width regulation, staggered particular symphonious end and space vector tweak. The writers firmly accept that this overview article will be valuable for scientists to discover applicable references in the field of topology and staggered reflector adjustment systems.

IndexTerms **- :** Diode clamped Inverter, Capacitor Clamped Inverter, Cascade H-Bridge Inverter, and Modulation Technique.

I. INTRODUCTION

An inverter is an electrical gadget that changes over direct flow into rotating flow. The staggered inverter is tuned close to the sinusoidal voltage of a few degrees of DC voltages. The staggered inverter is like the inverter and is utilized for mechanical application as an option in high and medium voltage circumstances. It was presented in 1975 as a substitute for high force and medium voltage by NABLE ELAL. In 2010, over 78% of the worldwide market was given to organized applications. Most sun based cell establishments include the utilization of numerous sun powered boards or units, associated in arrangement or equal. Topology of the H-connect staggered transformer requires a different DC hotspot for every H-connect, along these lines the blend of various modules with the staggered transformer makes it one of the appropriate alternatives for this kind of utilization. Traditional staggered transformers incorporate an arrangement H-connect transformer, a diode converter, and a plane capacitor connector. This paper presents a multi-stage staggered (H-connect) transformer.

II.EXISTING SOLAR POWER GENERATION SYSTEM

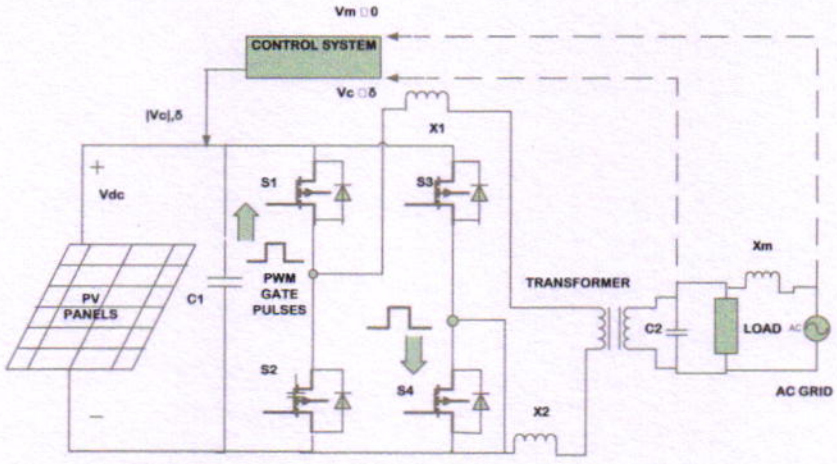

Figure no. 1

The vitality (ECE) transformation proficiency of the force age framework is lower. The proposed nearby planetary group comprises of a gathering of sun based cells, a DC-DC power transformer and another staggered transformer. The sun oriented cell get together is associated with a DC-DC power transformer, and the CC-CC power transformer is a transfer transformer that incorporates a transformer with a turn proportion of 2: 1. The seventh This new seven reflector levels comprises of a capacitor determination circuit and a full extension power transducer associated with a cascade. The electronic force switches of the capacitor choice circuit characterize release capacitors, while the capacitors are released separately or consecutively. The all out extension power transformer changes over this consistent three level voltage to a seven stage AC voltage synchronized with the voltage. The DC-DC power connector incorporates a bunch transformer and front force converter.

III. TYPES OF MODULAR MULTUI LEVEL INVERTER

Multi level inverters are three types
Diode clamped
Flying capacitor type
Cascaded or H-bridge type

Al/SiC METAL MATRIX COMPOSITE PARAMETERIZED OPTIMIZATION IN ELECTRODISCHARGE MACHINING

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Abstract :Al, SiCmetal matrix composites (MMCs) have significant applications in railways and IC Engines due to its excellent properties compared to other traditional materials. But the machining of MMCs is a big concern and still an area of research. Conventional machining of MMCs causes different problems like high tool wear, poor surface roughness, high machining cost etc. as a result, several researchers have used advanced machining methods like EDM, ECM, EBM, AJM etc. for effective machining of composites. EDM can be one of the best Nonconventional machining processes to machine such composites. In thispaper the utilization of EDM and its selection for machining of Al, SiCMMCs to get better quality of product and satisfactory machining characteristics has been studied. A Taguchi method has been used for optimization of different process parameters of EDM but Taguchi method is generally used for optimization of single response. EDM process is involved with multiple responses so a multi-objective (hybrid) optimization technique is need to use for optimizationpurpose

IndexTerms: **MMCs, electrochemical machining, electro discharge machining, abrasive jet machining, tool wear**

I. INTRODUCTION

Metal matrix composites (MMCs) were firstly used by Toyota in early 1980s. After that it finds avast application in different fields like automobile, aerospace and nuclear powerplantengineering.Thischaptercomprisesofbriefintroductionabout MMCs.

Composite

Composite material consists of two or more constituent materials altering in composition which have different physical or chemical properties. The constituent materials do not dissolve or merge completely into one another means they have their own identities although they act in concert.

The constituent materials that that make up composites are mainly of two types one is matrix binderandotheristhereinforcementorfillerelements.Matrixbindercanbeofdifferenttypes like polymers, metals, ceramics etc. similarly reinforcement can also be of different types like fibers, particles, flakes etc. The Matrix binder provides the bulk form and Holds the reinforcementinanorderlypattern[1].

Metal MatrixComposites

Composite materials consisting of metallic matrices, reinforced with ceramic particles or fibers, are known as metal matrix composites or MMCs. So MMCs consists of mainly two phases' primary phase that is metal matrix and secondary phase that is reinforcement [1]. The different functions of primary phase and secondary phase are given below:

Functions of the Matrix Material (PrimaryPhase)

- p r o v i d e s the bulk form of the part or product made of the composite material.
- H o l d s the imbedded phase in place, usually enclosing and often concealing it.
- W h e n a load is applied, the matrix shares the load with the secondary phase, in somecasesdeformingsothatthestressisessentiallybornbythereinforcingagent.

Function of the Reinforcing Phase (SecondaryPhase)

- I n c r e a s e in yield strength and tensile strength of MMCs.
- I m p r o v e m e n t of thermal shock resistance.
- m p r o v e m e n t of corrosion resistance.
- Increase in Young'smodulus.

ANSYS WEIGHT OPTIMIZATION OF ENGINE BLOCK

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***Abstract*:** The purpose of the cylinder (engine) block is to support the components of the engine. Additionally, the cylinder block transfers heat from friction to the atmosphere and engine coolant.The air - fuel mixture from the carburetor is supplied to cylinders of the engine at very high pressures and thus the cylinder undergoes stresses and deformations. The main challenge of the mechanical engineer is to design the engine block to withstand these pressures, and also with less weight, because due to heavy weight of engine block, power consumption will be high.

In this paper, a study on static and dynamic behavior of a diesel engine block is carried out in FEM for grey cast iron. Using FEM calculation the Stresses, Natural frequencies and Mode shapes are obtained. Besides, based on the results, the less stress locations on this block are identified to reduce the weight of engine, and model is modified. Further, the Analysis is also carried on modified model for grey cast iron.

Keywords: Diesel Engine Block, Frequency, Stress, Deflection, FEM, etc.

I. INTRODUCTION

Generally, an I.C. is defined as an engine during which the chemical energy is released by fuel inside the engine and directly used for mechanical work, as opposed to an external combustion engine during which a separate combustor is employed to burn the fuel[1, 2].

I.C. engine was conceived and developed in the late 1800s and had a significant impact on society as well as it is considered one of the most significant inventions of the last century. Basically, this type of engine becomes the foundation for the successful development of the various commercial technologies [1, 3]. As an example, considering how this sort of engine has transformed the transportation industry by allowing the invention and improvement of automobiles, airplanes, trains, etc. Depending on displacement, the I.C. engines deliver power within the range from 0.01 kW to 20x103 kW[4]. The complete in the market place with electric motors, gasturbinesand steam engines and its major applications are within the automobile vehicles, marine, railroad, aircraft, etc. The vast majority of I.C. engines are produced for vehicular applications which require a power output, order of 102 kW.A study on static and dynamic behavior of diesel engine block for grey Cast Iron is carried out using FEM where the Stresses, Natural frequencies and Mode shapes are obtained. Based on the results, the less stress locations on the block are identified to reduce the weight of engine, and model is modified& analyzed.

II. METHODOLOGY

A 3D model of the Engine block has been created using NX-CAD software and the static analysis on Engine block is performed using ANSYS software. The deflections and von-mises stresses produced in the Engine block are obtained.The modal analysis of the Engine block with Grey cast iron is carried out and natural frequencies and there mode shapes are obtained.Also, the harmonic analysis of the Engine blocksare performed and the deflections and von misses stresses is obtained at critical frequencies. If any critical condition is found during analysis and design is not found suitable then engine block is again redesign and analyzed to get within limits.

III. DESIGN CALCULATIONS

a) Design of Cylinder:

i) The Longitudinal stress induces in cylinder, $\sigma_L = \frac{\text{Load}}{\text{Area}} = \frac{\frac{\pi}{4}D^2F}{\frac{\pi}{4}(D_O{}^2 - D^2)}$

Where,

D	=	Inside Diameter of cylinder	=	75mm
D_0	=	Outer diameter of cylinder	=	85mm
F	=	Maximum pressure inside the cylinder	=	$7 * 10^{-1}$ MPa

Apparent longitudinal stress induced in cylinder, $\sigma_L = \frac{\frac{\pi}{4}*(75)^2*7*10^{-1}}{\frac{\pi}{4}((85^2)-(75^2))} = 2.46\ MPa$

ii) Length of stroke, $l = 1.8 *$ Inside diameter of Cylinder

5G BASED V2X COMMUNICATION FRAMEWORK

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Abstract
5G wireless systems will extend mobile communication services beyond mobile telephony, mobile broadband, and massive machine-type communication into new application domains, namely the so-called vertical domains including the smart factory, smart vehicles, smart grid, smart city, etc. Supporting these vertical domains comes with demanding requirements: high-availability, high-reliability, low-latency, and in some cases, high-accuracy positioning. The fifth generation (5G) of mobile communication networks, and specifically millimeter-wave (mmWave) New Radio (NR), aims to enable this future with ultra-low-latency, ultra-wideband services, opening up a whole new era of applications and services, much like 4G Long Term Evolution (LTE) did a decade ago. To enable 5G, the Third Generation Partnership Project (3GPP) is focusing on defining the technical specifications for NR technology, as well as enhancements to the current LTE.In this study we have explored how 5G can help to evolve next generation transport sector. This study includes detailed survey of different technologies for V2X 5G Communication system.

Key Words: *5G Wireless Technology, Smart Vehicle , 3GPP, millimeter-wave*

I.INTRODUCTION

The fifth-generation (5G) wireless systems have incorporated radical recent technological advancements for significantly enhancing the wireless capacity and adaptability. In addition to supporting mobile broadband services, they will also allow to connect a massive number of different devices having diverse quality of service (QoS) requirements 5G mobile network services are classified into three categories, namely eMBB, uRLLC and mMTC, to meet the requirements of automation in multiple vertical domains. These three types of services support many aspects of different use cases in different vertical domains. eMBB aims for fulfilling the ever-increasing mobile traffic demand imposed by bandwidth-hungry services, such as high definition (HD) videos, virtual reality (VR) and augmented reality (AR). Meanwhile, the time-sensitive networking and mission-critical services such as assisted and automated driving, robot-motion control, and remote management, are satisfied by the uRLLC mode. Furthermore, mMTC is aimed at supporting dense connections of various device types (e.g, mobile devices, IoT devices and sensors) in crowded areas, such as smart cities and smartfarming.

Fig. 1: Automation in the verticaldomainsrelying communication.

Fig 2 : Vertical domains and arrangement in on5G 5G servicetypes.

II. 5G V2XCOMMUNICATIONS

Vehicle-to-everything (V2X) communication refers to information transmission to/from a vehicle to any entity in a vehicular communication system that incorporates several specific types of communication, such as V2I (vehicle-to-infrastructure), V2N (vehicle-to-network), V2V (vehicle-to-vehicle), V2P (vehicle-to-pedestrian), V2D (vehicle-to-device) and V2G (vehicle-to-grid) communications. The motivation of applying 5G V2X to multiple vertical domains, especially in the automotive and smart city domain is to reduce latency to improve reliability [1], based on a promising business model [2], and to enable safe transportation [3], [4]. In [2], 5G-PPP provides a study of 5G V2X deployment including both the business models, and the stakeholders, describing how to calculate the costs and profits in such a system. A compelling benefit of the V2X communications technology is to support safe transportation, which is foreseen to be soon available in some countries. By sharing data, such as vehicular position and speed to surrounding vehicles and infrastructures through V2X communications, connected vehicles can enhance their awareness of potential accidents and significantly improve collision avoidance. D2D communication together with multi-RAT is considered to be an attractive technique of reducing the latency and improving reliability [1]. V2X communication is an ultimate evolution of D2D communication in 5G networks. Which requires low-latency and high-reliability for automation.

PROCESS PARAMETER OPTIMIZATION IN MICROWIRE ELECTRICAL DISCHARGE MACHINING

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Abstract *:* Micro wire EDM is a trending innovation in the field of Micro-machining to create complex smaller scale items. It is an intricate procedure including the diverse procedure parameters. In the present examination an enhancement of micro wire EDM has been completed utilizing Grey Taguchi technique. The parameters included are voltage, capacitance, feed rate and wire speed.MRR and kerf width are taken as the response criteria. The experiment has been done in multi-process Micro-Wire EDM machine. Wire electrical discharge machining process is an exceptionally perplexing, time changing and stochastic procedure. This is utilized in the fields of kicks the bucket, molds ; accuracy assembling and form cutting and so forth any mind boggling shape can be produced with high evaluation of precision and surface complete the process of utilizing CNC WEDM. The yield of the procedure is influenced by huge number of information factors. Henceforth an appropriate determination of information factors for the wire electrical discharge machining (WEDM) process relies vigorously upon the administrator's innovation and experience. WEDM is widely utilized in machining of conductive materials when accuracy is of prime significance. Unpleasant cutting activity in wire EDM is exceptionally testing one since progress of more than one execution measures viz. Metal removal rate (MRR), surface finish and cutting width (kerf) are of prime significance. This paper proposes ideal parameter setting. Utilizing Taguchi's parameter plan, noteworthy machining parameters influencing the presentation measures are distinguished as pulse peak current, pulse on time, and duty factor. The impact of each control factor on the presentation measure is examined independently utilizing the plots of sign to the plots of signal to noise ratio. The investigation shows that the WEDM procedure parameters can be balanced in order to accomplish better metal removal rate, surface finish, electrode wear rate.**

IndexTerms **- EDM, WEDM, Taguchi Method, OA**

I. INTRODUCTION

Electrical discharge machining (EDM) is one of the most extensively used non- conventional, thermo-electric metal removal process which encodes material from the work place by a series of discrete spark between a work and a tool electrode immersed in a liquid dielectric medium. Electrical energy is used directly to cut the material in final shape. Melting and vaporization takes place by theses electrical discharges. The minute a mounts of the work material is then ejected and flushed away by the dielectric medium. The sparks occur at high frequency which continuously and effectively removes the work prices material by melting and evaporation. To initiate the machine process electrode and work piece are separated by a small gap known as 'spark gap' which results into a pulsed discharge causing the removal of material. The dielectric acts as a deionizing medium between two electrodes and its flow helps in vacating the debris to assure optimal conditions for spark generation. In micro-wire EDM operation the work piece metal is cut with a special metal wire electrode that is programmed to travel along a definite path. Spark discharges and generated between a small wire electrode and a work piece to produce complex two dimensional and three-dimensional shapes according to a NC path. A very thin wire in the range of 0.02 to 0.3 mm in diameter as an electrode is used in the wire-cut EDM. It machines a work piece with Electrical discharge machining (EDM) is one of the most extensively used non- conventional, thermo-electric metal removal process which encodes material from the work place by a series of discrete spark. The CNC system of wire EDM has the duty to provide the function of geometry trajectory, sequential control, pulse generator control, wire feed and wire tension control and machining process control. The wire transport system of a wire EDM guarantees a smooth wire transport and constant tension of wire. The machine consists of a work piece contour movement control unit, work piece mounting table and wire driven part which ensures accurate movement of the wire at constant tension. The purpose of WEDM is to achieve better stability and higher productivity, higher machining rate with accuracy. A large number of variables are involved in the process.

EXPERIMENTAL SOIL ANALYSIS

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Abstract : An analysis has been done to enhance the soil properties, by reinforcing it with randomly distributed waste coir fibre materials and tyre waste with varied proportion and conducted test like, compaction test and California bearing ratio test as per Indian standard specification. The observations drawn from the results present their potential of being used in various geotechnical solutions with a cost effective approach. As per the IS code, the test samples were prepared at their respective maximum dry density and optimum moisture content. The low plasticity clay reinforced with fibres shows crack fracture and surface shear fracture failure modes, making the polyester fiber as a good earth reinforcement with a huge stance in the future era.

Index Terms **- compaction test, CBR test**

I. INTRODUCTION

The foundation plays a vital role for the stability and the serviceability of any structure built on it. It has to be strong enough to bear the load coming on it without any further settlement. A deep insight of the soil properties and behavioral responses, would pave a better approach for any improvement in the soil quality. Nowadays, with increase in population and with the pressurizing extensive construction, ground improvement techniques raises it bar. And soil stabilization comes in with a cool breeze to soothe our geotechnical puzzles. Soil stabilization refers to the improvement of physical and engineering properties of the soil accordingly as per our need, by different means available to us in the nature.

Nowadays, reinforced earth technique is capturing the worldwide attention due to its adaptability in each and every situation. It is used in various structures like retaining walls, earth dams, high rise structures, for increasing the shear strength of the soil. The reinforcements can be either natural or synthetic in its built. And the utilization of waste materials as a reinforcement would add up to its value.

Solid waste disposal has created a havoc in the present scenario. In our country, the scrap tyres lead to large masses of its deposition. The pollution caused due to the polyphenol leaching and the resistance to degradation due to the stable lignin structure makes the coir waste a potential threat to the land resources. So, recycling these waste in a constructive manner leads to the sustainable development.

Here, in this research work, soil stabilization is done with the help of randomly distributed polyester fibres in the form of rubber tyres and coir as an cost effective geotechnical solution. Many research works have been conducted in this field, but still conquering it, is still quite a time away.

Different methods are adopted for the soil stabilization, here, we are modifying the soil by reinforcing fibres of waste material like rubber tyre and coconut coir. These fibres are added to the soil accordingly,

1.1. Oriented fiber reinforcement
1.2. Random fiber reinforcement

1.1. Oriented fiber reinforcement

Here, the fibres are placed symmetrically in a systematic pattern maintaining a proper orientation. Similarly other layers are placed on it, maintaining the same arrangement one above the other, continued for the entire thickness of soil mass. Here, fibres are used in the form of sheets, bars in this type of arrangement.

1.2. Random fiber reinforcement

Here, distinct fibres are placed randomly in the entire thickness of soil mass. Here, a homogeneous mixture is prepared of the soil and reinforcement. The reinforcement used here, can have different physical properties like, nylon, metal strips or any other material. It is not only easy to mix, but also provides homogeneity without any effective failure plane, and also imparts ductility to the structure.

II. OBJECTIVE :

The main aim of this project is to make use of waste fibre materials (tyre waste and coir) to improve the soil quality.
Here, the soil is reinforced with different proportions of coir and tyre and accordingly, compaction tests are carried out to analyze the samples.

STUDY OF CONCRETE CRACK PARAMETERS DUE TO BACTERIAL EFFECT

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Abstract : . In this research we have developed bacterial concrete. Here, the cementation by microbiologically induced calcium carbonate rain has been introduced for the remedies of micro cracks, where the bacteria is induced in the mortar and concrete to seal the cracks. Cracking is a ordinary problem developed due to reasonably low tensile strength in concrete. A typical durability related occurrence in many concrete construction is crack formation. Besides durability, Cracks in concretes occur due to other implements such as shrinkage, freeze-thaw reactions, and mechanical compressive and tensile forces. Cracks play a vital role for the reduced service life of concrete structure. Regular manual maintenance and repair of concrete construction is costly and in some cases not possible, but autogenous repair would save a considerable amount of resources. Concrete structures have the potential to seal freshly formed micro-cracks. This property is due to the presence of non-hydrated excess cement particles within the materials matrix, which undergo delayed or secondary hydration upon reaction with the access of water. So a reliable self-healing technique for concrete would not only result in more durable structures, but also favorable for the global economy.

Index Terms - Self-healing, micro-cracks, CaCO3 precipitation, bacteria, autogenous repair

I.INTRODUTION

As a structural material, concrete receive extensive use everywhere in the planet. The common problem is the higher possibility of cracking caused by low tensile strength in concrete structure. Crack formation in concrete structures is a occurrence that can rarely be avoided due to shrinkage and tensile stresses. While larger cracks can potentially hamper a structure's integrity, smaller cracks typically with a crack width smaller than 0.2 mm do not create problems. Although micro-cracks do not necessarily result in losses of strength but helps in material porosity and permeability, the ingress of water and other reactive chemicals such as chloride, sulphates and acid may hamper the steel reinforcement as these strongly enhance its erosion rate and durability for a long term. Autogenous cracks are developed in concrete by adding the microbial self-healing agent which has the potential to improve self healing capacity mainly achieved by bacteria influenced mineral precipitation by direct method or encapsulation way. In this study, the properties of normal concrete and bacterial concrete are studied by conducting various tests such as compressive strength, tensile strength, flexural test with different grades as M20, M25, M30.When bacteria is used to work for the healing of cracks in concrete, the most important point is the high alkalinity available in environment, which helps the growth of the bacteria.

I. SELF HEALING AGENT

The bacteria which behaves as self healing agent in concrete should be able to perform long-term effect in crack sealing, throughout the life time of the construction. Self-healing concrete is a product which produces limestone by which cracks on the surface of concrete structure heals. Selected categories of the bacteria Bacillus with calcium-based nutrient referred to as salt, nitrogen and phosphorous are mixed to the concrete when it is being mixed. The principal mechanism of self crack healing is that the bacteria act as a catalyst, and transform a parent compound to a suitable filler material. The utilization of bio mineralogy in concrete is invented a new material known as bacterial concrete.

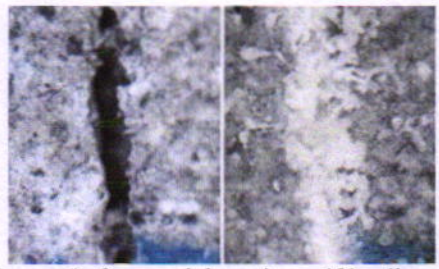

Figure -1:- Image of before and after crack by using self healing concrete

II. OBJECTIVES

The main purpose of self healing concrete is to enhance the service time and durability of the concrete work.

1. This concrete ease the loss of materials and also to build eco friendly civil works.
2. Self healing techniques permit the concrete to get back liquid tightness by using of micro-organisms and hydrogels.
3. In self healing techniques, using of encapsulated polymers prevent future durability problems when cracks in concrete occur under dynamic loading.
4. Monitoring techniques and non-destructive testing designate the effect of various self-healing mechanisms in small and full-size specimens.
5. It develops construction detail and structure within the project by using self healing product.

Addressing the Needs for English Language Training in English for Engineers

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Abstract: A language is a technique of human communication, either spoken or written, consisting of the use of words in a structured and conventional way. From the thousands of languages spoken & written all over the world, English is the internationally acclaimed language. Its importance can be considered from the fact that it is used as the standard language for communication, science, information technology, business etc. Engineering is one of the major fields of study in the world and it is used in many works of research and studies. English is significant for non-native speakers because it is widely spoken all around the world and in every field. For engineering students whose mother tongue is not English, mastering it is especially important, not only meant for their education but also for their prospective career. Devoid of a good communication, engineering students discover themselves being incapable to understand the core concept or idea. English verbal communication makes a candidate confident, smart, and self reliant which is the prevalent need of present time.
Key Words: English language, Communication, Engineering

INTRODUCTION:

Good communication is the bridge between confusion and clarity and what is a better way than using a global language. The existence of our kind is based on communication. Communication in today's world is challenging and exhilarating. This communication skill has shaped an enormous demand for teaching and learning. English as a language crucial for everyone for example engineer, a non technical graduate, under graduate and even school students. English is a lingua franca- an adopted language. No other language has the same influence of becoming a link language.

Engineering now a day, has turn out to be the de-facto graduate for a large mass of students. But a study has exposed that most of them are not even qualified for a job. In India, the dilemma is not always unemployment but employability. Many engineering students from India are found to be unemployable not for the incompetency in engineering skills rather than it's their adeptness in English language and soft skills, which make them, drop out on opportunities.

IMPORTANCE OF ENGLISH COMMUNICATION:

Good English is not only graceful but likelihood to go on with studies and specializations in the best universities in the world, which are in fact, in countries where they speak English. But India, a country with diverse languages, people find it difficult to communicate in their mother tongue with others like Hindi, cannot use in southern states. Education is extremely vital to develop yourself but learning English also improves the standard of living. You have access to jobs that you could not even take into contemplation, you can estimate an international career and you can dwell in many countries with the no difficulty of being able to go shopping or vacation. The reimbursements they fetch in the life of a person's comprehension of the English language are limitless. What is vital to understand is that the English language is able to knock down scores of barriers, together with cultural ones. Knowing the routine and traditions of other countries allows us to understand ourselves and others more precisely. By improved understanding our associate man around the world we are constantly amazed at how we are unlike and related at the same time. The English language allows us to relate and consequently to understand one another.

The deficiency of knowledge in the English language, and not being fluent, always reserved students back from participating, and from applying for courses. There were times when students felt undeserving, had extremely low self esteem. Today's job market in India is fairly difficult and challenging that the engineering graduates is anticipated to acquire employable traits when they come out for job interviews. One of the core persona that the recruiters and HR managers are searching for throughout the placements is English fluency which in one way deliver that English communication skill is one of the most important employability necessities in modern India.

RECTANGULAR CELLULAR AUTOMATA WITH PERIODIC BOUNDARY CONDITION CLASSIFICATION OF LINEAR RULES

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Abstract: In this paper we have been studied two dimensional nine neighborhood Cellular Automata (CA) which is called Rectagonal Cellular Automata (RCA). There are 2^{512} total number of rules in case of two state RCA with nine neighborhood among them 512 rules are linear. In this article we have constructed and analyzed all 512 linear rules of RCA in periodic boundary condition using matrix method. Further we have extend our work to classify those rules by using graph theory. We have found that among 512 rules some of the rules are singly connected graphs and some are multiple connected graphs. And also we have observed eight fundamental rules shown the property of Hamiltonian path. We have also observed that most of the matrix properties with periodic boundary condition similar to that of null boundary condition. In our analysis we have found that there are no reversible rules in RCA with periodic boundarycondition.

Index Terms **– Rectangular Cellular Automata, periodic boundary condition, binary matrix, Hamiltonian path.**

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1 INTRODUCTION

Cellular Automaton (CA) is a mathematical model which explains complex phenomenon of nature using simple updating rule. Inthismodelallthecellsareuniformlyattachedtoeachotherandeachcellhasadefinitestate.Cellsstateshaveupdatedinregular interval of time with a specific update rule. This rule is a function of the current state of the cell as well as states of the neighborhoodcells.Thesestatesofthecellsareupdatedinaunittimesimultaneously[1,2].Timecomplexityforupdatingstateof the cells is the least as compared any traditional model. Cellular Automaton are arranged in chains of cells, if it is arranged in a linear chain, it is called one dimensional CA, if it is arranged in row wise and column wise linear chains of cells it is called two dimensional CA. Nearest neighborhoods cells are those cells if there is no cell is present between the two cells. In rectangular lattice one can take four directions i.e., north, south, east and west cells as neighborhood cells, this is called von Neumann neighborhood and by adding another four corners to the von Neumann neighborhood it is called Moore neighborhood. But in our paperwehaveconsideredMooreneighborhoodandonecentralcellwhichisanineneighborhoodCA[3].

ThenumberofrulesinCAdependsonnumberofstatesandnumberofneighborhoodswhichincreasesastronomicallywiththe increaseinnumberofstatesandnumberofneighborhoods.Tofindaspecificruleamongalltherulestosolveaparticularproblem is a daunting task. So one of the way is classification of these rules. In one dimensional three neighborhoods two states CA where 256 different rules has been classified by Wolfram [4] into four different classes by plotting space-time diagrams of these rules. Uniform linear rules in two-dimensional CA at null boundary condition are classified into nine groups considering XOR operation [2]. Linear rules of two dimensional CA has been classified by observing the behavior of the rules at a finite time iteration [5]. Usingcolorgraphstomodelallthelinearrulesintwo-dimensionalCAatnullboundaryconditionhasbeenstudiedin[6].In[7],2^7 linearruleshasbeenclassifiedofatwostatehexagonalCAundernullboundaryconditionbyconstructingbinaryrulematrices.All of the work has been studied in null boundary condition. Classification of linear rules in two dimensional CA under periodic boundaryconditionhasyettobestudiedwhichmotivatesustostudy inthisarea.

Forafinitedimensionsimulationofaphysicalsystem,itisimportanttotakecareboundarycells.Ithasbeenstudiedforvarious boundary conditions show various results of a physical system. Applications of two dimensional cellular automata linear rules hasbeen studied in [8] where $Rule_{29}$, $Rule_{113}$, $Rule_{263}$ and $Rule_{449}$ have been used for edge detection of a binary image with adiabatic and reflexive boundary conditions very efficiently. Depend on the size of the problem matrix, it has been studied that the Ising model behaves differently at different boundary conditions by using probabilistic RCA [9]. In our work it has been found that different rule matrices with periodic boundary condition than in null boundary condition [2]. Periodic boundary condition is the most used boundary condition to simulate a physicalsystem.

We have organized this paper as follows, in section 2, we have discussed the theory of a two dimensional CA in a rectangular grid and how to construct a binary rule matrices of RCA with periodic boundary condition. All these rules have been designed in the theory and have been classified through matrix algebra and through graph theory in section 3 and our conclusion and future perspective are discussed in section 4.

AN ENHANCED PSO BASED RETROFIT PLACEMENT IN NON-CODE REINFORCEMENT CONCRETE STRUCTURE

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Abstract :Earthquakes that caused the greatest loss of life, while powerful, were deadly because of their proximity to either heavily populated areas or the ocean, where earthquakes often create tsunamis that can devastate communities thousands of kilometers away. Regions most at risk for great loss of life include those where earthquakes are relatively rare but powerful, and poor regions with lax, unenforced, or nonexistent seismic building codes. Optimization methods were used with the structural analysis to reduce the cost and improve the performance of seismic mitigation retrofit schemes. To reduce the seismic risk of deficient structures, different retrofit options are available. The structure could be torn down and replaced with a modern structure that follows the appropriate design standards. Full demolition and reconstruction could be very costly and the remaining lifetime value of the building would be lost. Also, demolition of a historically significant building would be a loss of value to society.

I. INTRODUCTION .

The 2004 Indian Ocean earthquake occurred at 00:58:53 UTC on 26 December with the epicenter off the west coast of Sumatra, Indonesia. The shock had a moment magnitude of 9.1–9.3. The undersea mega thrust earthquake and triggered a series of devastating tsunamis along the coasts of most landmasses bordering the Indian Ocean, killing 230,000– 280,000 people in 14 countries, and inundating coastal communities with waves up to 30 meters (100 ft) high. Indonesia was the hardest-hit country, followed by Sri Lanka, India, andThailand.

(Indian ocean earthquake affected countries) Fig(1)

The 2010 earthquake by 24 January at least 52 aftershocks measuring 4.5 or greater ad been recorded. An estimated three million people affected by the earthquake .The government of Haiti estimated that 250,000 residence and 30,000 commercial buildings had collapsed or were severely damaged. The earthquake caused major damage inPort-au-Prince ,jackmel and other cities in the region.

(Building crashed in Port-au-Prince)
Fig (2)

The structural damage from the Chile earthquake was reduced because of the modern design standards used in that region. Modern design concepts include consideration of the load path to prevent catastrophic failure, proper detailing to resist cyclic loads, and elimination of stiffness irregularities. Conversely, the lack of proper construction practices in Haiti meant a much larger portion of the buildings collapsed despite a comparable earthquake magnitude with Chile (Kovacs, 2010). These differences highlight the improvements of modern seismic 2design over past practices. Improved understanding of the behaviour and motion of structures in an earthquake had been applied to design more resilient structures thus improving its seismic performance. Old structures, however, in many locations, built before modern seismic design practices, are still vulnerable (Kovacs, 2010; Tesfamariam and Saatcioglu, 2008,2010).

FRACTIONAL ORDER DERIVATIVES: NUMERICAL EVALUATION OF DERIVATIVES

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Abstract : Numerical evaluation of derivatives of fractional order $1-\alpha$, $0<\alpha<1$ has been considered by applying a four point approximation formula meant for derivatives and the technique of numerical evaluation of integrals of fractional orders α .
IndexTerms - Fractional derivative, fractional integral, quadrature rule, corrective factors.

MATHEMATICS SUBJECT CLASSIFICATION: 65 D 30

I. INTRODUCTION

In recent years the subject fractional calculus has been found immense and wide applications in different branches of science and engineering, some of which have been highlighted in Oldham and Spanier (2006) and Dalir and Bashour (2010). Due to its immense applications, the numerical treatment of this subject has been drawing more and more attentions. Some of the numerical techniques developed for the evaluation of integrals and derivatives of fractional orders are due to Lether et al. (1982), Diethelm and Walz (1997) and Acharya et al. (2011).

Acharya et al. (2011) have considered the numerical evaluation of integrals of fractional order α , $0<\alpha<1$, denoted as $D^{-\alpha}f(x)$ and given by

$$D^{-\alpha}f(x)=\frac{1}{\Gamma(\alpha)}\int_0^x\frac{f(t)}{(x-t)^{1-\alpha}}dx \tag{1}$$

The definition of integral of fractional order α specified by equation (1) is in the Riemann-Liouville sense.

In this paper we consider the numerical determination of the derivative $D^{1-\alpha}f(x)$ of fractional order $1-\alpha$ which is given by

$$D^{1-\alpha}f(x)=\frac{d}{dx}\left\{D^{-\alpha}f(x)\right\} \tag{2}$$

where the function $D^{-\alpha}f(x)$ is differentiable.

II. NUMERICAL APPROXIMATION OF DERIVATIVE OF FRACTIONAL ORDER

It is pertinent to note that the numerical evaluation of the derivative of fractional order $1-\alpha$, involves the integral of fractional order α which should be evaluated numerically as accurately as possible. For an accurate numerical evaluation of the fractional integral $D^{-\alpha}f(x)$, Acharya et al. (2011) have applied *n*-point Gauss-Legendre quadrature rules or Radau *n*-point rules along with corrective factors $C_r(x)$ of order $r\le 5$ which is prescribed as

$$C_r(x)=\frac{1}{\Gamma(\alpha)}\sum_{j=0}^{r}\frac{(-1)^j f^{(j)}(x)}{j!(j+\alpha)}x^{j+\alpha}. \tag{3}$$

The corrective factor $C_r(x)$ in conjunction with the quadrature rule yields the approximation for $D^{-\alpha}f(x)$ in the following form:

$$D^{-\alpha}f(x)\approx Q_{-\alpha,n}(h;x)+C_r(x) \tag{4}$$

where $Q_{-\alpha,n}(\cdots)$ is either the *n*-point Gauss-Legendre quadrature rule or the *n*-point Radau rule meant for the numerical approximation of fractional integral $D^{-\alpha}h(x)$ i.e.

$$D^{-\alpha}h(x)=\frac{1}{\Gamma(\alpha)}\int_0^x\frac{h(t)}{(x-t)^{1-\alpha}}dt \tag{5}$$

where

$$h(t)=f(t)-\sum_{j=0}^{r}(t-x)^j f^{(j)}(x)/j!\,. \tag{6}$$

SCHEDULING SHORT-TERM FIXED HEAD H-TH USING EP & PSO TECHNIQUE

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Abstract- This article presents a novel approach to the economic solution of power generation of short-term hydrothermal scheduling problem using an particle swarm optimization technique (PSO) and Evolutionary Programming Technique(EP). The practical hydrothermal system is highly nonlinear and non-convex due to its equality and inequality constraints that make the problem difficult in finding global optimum solution using any mathematical approaches. In this Project the inherent basics of conventional PSO algorithm is suggested that deals with an inequality constraints. To show its efficiency and effectiveness, the proposed PSO is applied to one hydrothermal test system with one hydro plant and one equivalent thermal plant. The simulation results reveal that the proposed PSO appears to be best in terms of convergence speed, solution time, and minimum power generation cost.

Evolutionary Programming technique for the solution of Hydrothermal Scheduling Problems with generating units having non-smooth fuel cost curve. The performances of the algorithm is demonstrated through the same test example. Numerical results show the proposed EP approach provides a cheaper schedule even than the SA approach and hence , has more powerful ability to achieve the global optimum solution than the SA approach. Both the techniques are implemented on a numerical Test and the Results arecompared.

Index Terms—The Hydrothermal scheduling, Practical constraints, Particle swarm optimization, Evolutionary Programming.

1. INTRODUCTION

In this paper, an efficient short-term hydrothermal scheduling algorithm based on EP and PSO techniques have been proposed. The thermal generating units are represented by an equivalent unit. All practical constraints such as generator-load power balance equations, total water discharge equation, reservoir volume constraints, reservoir volume limits and the operation limits of the hydro and equivalent thermal units are taken into account fully in the algorithm. The numerical results obtained from the EP and PSO as well as the developed methods are compared. Test results confirm that the EP technique and the PSO techniques are both reliable and giving best results according to the different Optimization problems. These techniques are preferable in searching for the global optimal solution of the hydrothermal scheduling problem.

2. DESCRIPTION OF THE RESEARCHWORK

In this paper work two stochastic methods i.e. Evolutionary Programming Technique and Particle Swarm Optimization are implemented on a standard Optimization problem, the results are compared.

METHOD-1

EVOLUTIONARY PROGRAMMING TECHNIQUE

Evolutionary programming is a powerful general- purpose technique for solving complex real-world optimization problems. Like genetic algorithm, this technique works on population of trial solutions, imposes random changes to those solutions to create offspring and incorporates the use of selection to determine which solutions to maintain into future generations and which to remove from the pool of trials. But in contrast to GA, the individual component of a trial solution in EP technique is viewed as a behavioural trait, not as a gene. In other words, EP technique emphasizes the behavioural link between parents and offspring's rather than the genetic link. It is assumed that whatever genetic transformation occurs, the resulting change in each behavioural trait will follow a Gaussian distribution with zero mean difference and some standard deviation. The production of an offspring population is called a generation. Many such generations are required for the population to converge to an optimum solution, the number increasing according to the problem difficulty. In the EP algorithm the maximum number of generations, i.e., maximum number of iteration is defined. When applied to a minimization process, the algorithm of EP can be described as below.

A SUMMARY OF TECHNIQUES FOR HARMONIC DISTORTION AND DEPRECIATION

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Abstract: This paper declare the Harmonics in power systems purposed by highly non-linear devices diminishes its performance. So many ambiguous originate in the operation and management of power systems containing Renewable Energy Sources (RES) that alter the systems power quality. These ambiguous can originate due to system parameter removes or design parameter choice. For many years controlling and reducing such harmonics has been a major concern of power engineers. This paper explains the problem of harmonics pollution in electric networks and control methods. It proposes how the waveform of voltage/current is distorted and harmonics are inserted to the system due to non-linear loads such as Variable Speed Drive, Arcing Devices, UPS, Personal Computer, Printers, Fluorescent Lamp, and Cell Phone battery charger.
Keywords: Harmonics; Non-liner load; Harmonic Distortion; Neutral Current.

I. INTRODUCTION:

The collision of harmonics and waveform distortion on the quality of electrical power harmonic distortion is the changes in the waveform of the supply voltage from the sinusoidal waveform. It is caused by the interaction of distorting customer loads with the impedance of the supply network. Its major adverse effects are Malfunctioning and failure of electronic equipment, Overheating and failure of electric motors, Overloading, overheating and failure of power factor correction capacitors, Resonance due to interaction of capacitors with harmonics, Excessive measurement errors in metering equipment, Spurious operation of fuses, circuit-breakers and other protective equipment.

II. Harmonics:

A harmonic is a current or voltage multiple of the fundamental frequency of the system in an electric power system, induced by the operation of non-linear loads such as rectifiers, discharge lighting, or saturated magnetic devices. Harmonics is one of the leading power quality problems in industrial and commercial power systems. A harmonic of an electrical signal is described as the content of signal whose frequency is an integral multiple of the fundamental frequency. IEEE Standard 519 Harmonics is defined as "a sinusoidal component of a periodic wave or quantity having a frequency that is an integer multiple of the fundamental frequency". Harmonic analysis is the measure of calculating the magnitudes and phases of the fundamental and higher order harmonics of the power system.

III. Harmonic Distortion:

Harmonic distortion is defined as the ratio of harmonics to fundamental when a (theoretically) pure sine wave is reconstructed, and is the most common specification.

IV. Harmonic Indices:

These values, or harmonic indices, serve as a useful metric of system performance. The two most frequently used are total harmonic distortion (THD) and total demand distortion (TDD). They are measures of the effective value of a waveform and can be applied to both current and voltage.

V. Non-Linear Loads and Types:

Non-linear loads means the current is inversely proportional to voltage. Essential examples of Single phase non-linear Loads are Computers, Fax Machines, Photocopiers, UPS's, TV's, VCR' s, Lighting dimmers & Electronic ballasts for high efficiency lighting, Single-phase AC & DC drives, Ultra-violet disinfection systems. Equivalently Three Phase Non-linear loads are Variable speed AC & DC drives, UPS systems, Arc furnaces, SCR, temperature controllers, Battery chargers, etc.

A. Variable Speed Drive:

Variable speed drives (VSDs), also called adjustable speed drives (ASDs), are devices that can vary the speed of a normally fixed speed motor. In HVAC systems, they are used primarily to control fans in variable air volume systems instead of other devices such as inlet vanes and discharge dampers..

B. fluorescent lamps:

A fluorescent lamp, or fluorescent tube, is a low-pressure mercury-vapor gas-discharge lamp that uses fluorescence to produce visible light. An electric current in the gas excites mercury vapor, which produces short-wave ultraviolet light that then causes a phosphor coating on the inside of the lamp to glow. The typical waveforms are given in figure.

STARLIKE FUNCTIONS WITH NEGATIVE COEFFICIENTS: SOME RESULTS

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Abstract : The most prioritized topic while studying univalent analytic function is the Riemann mapping theorem. In this communication, we introduced 'S' be the class of function **f**in H that are univalent in D. A new subclass of S^*-starlike functions of order α is studied in this paper. Some of the properties of these S^*-starlike function with negative coefficients including the starlikeness, univalence are reflected. Some other aspects such as integral transforms , quasi-hardmard product functions are discussed. Various examples are provided to study the results of negative coefficient functions of order ¼.

IndexTerms **- Starlike function, univalent analytic function, quasi-hardmard product.**

I. INTRODUCTION

The concepts of analytic function and univalent are heavily used in mathematics. The function f which is a complex valued by nature is said to be analytic in a domain Ω(a nonempty open connected subset) if it has a uniquely determined derivative at each point of Ω. The function f is defined as univalent in a domain Ω, if it never takes any value more than once, that is, the condition $f(z_1) = f(z_2)$, $z_1, z_2 \in \Omega$ implies $z_1 = z_2$.A necessary condition for an analytic function f to be univalent in Ω is $f'(z) = 0$ in Ω. This condition is not sufficient which can be seen by considering the function $f(z) = \exp(z)$ whose derivative never vanishes. But clearly it is not univalent in C. The Riemann mapping theorem states that if Ω is a simply connected domain whose boundary consists of more than the point and z_0 is a point in Ω then there exist a unique univalent analytic function f which maps Ω conformally onto the unit disc $D = \{z \in C : |z| < 1\}$, and the properties $f(z_0) = 0$ and $f'(z_0) = 1$.While studying geometric properties of functions univalent and analytic in a simply connected domain $\Omega$with more than one boundary point one may therefore confine, without loss of generality, it is enough to consider functions analytic and univalent in the unit disc D. If the function $f(z) = (\frac{g(z) - g(0)}{g'(0)})$, since $g'(0) \neq 0$ then g is analytic & univalent in D. So, considering f in Das univalent analytic function which satisfies $f(0) = 0$ and $f'(0) = 1$. Let H be the class of functions f analytic in D and normalised by the conditions $f(0) = 0$ and $f'(0) = 1$, and let S be the class of function f in H that are univalent in D. The Taylor series expansion of such a function f about the origin has the form

$$f(z) = z + \sum_{n=2} a_n z^n \qquad (1)$$

Unless otherwise stated explicitly, it is assumed throughout in the sequel that whenever $f \in S$, is in Taylor series representation of the form (1). The koebe function $k(z) = z(1-z)^{-2}$ which maps the unit disc D onto the entire complex plane minus the part of the negative real axis from 1/4 to infinity is theleading example of a function in S. A few illustrative of such functions in S are

$$z, \frac{z}{(1-z)^{-1}} \text{ and } \frac{1}{2}\log\frac{1+z}{1-z}.$$

In the univalent function theory was initiated by koebe [13] in 1907 on the uniformization of algebraic curves. He discovered that the ranges of all functions in S contain a common disc $|W| \leq b$, where b is an absolute constant. The koebe function $k(z) = z(1-z)^{-2}$ shows that $b \leq \frac{1}{4}$. Bieberbach's [2] establishes that $b = \frac{1}{4}$. He also proved in the same paper that if $f \in S$ then $|a_2| \leq 2$ with equality occurring iff f is a rotation [$g(z) = e^{-i\theta} f(e^{i\theta} z)$] of the koebe function. Motivated by these extremal properties of the koebe function, Bieberabach conjectured that forever

$$F(z) = z + \sum_{n=2} a_n z^n \in S, a_n \leq n, \; n = 2, 3, \ldots . \qquad (2)$$

A REVIEW OF BIG DATA CLASSIFICATION: CLASSIFY INTRUSION USING MACHINE LEARNING TECHNIQUE

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Abstract:
Big Data Analytics is anactivity of examine and accepting the singularity and features of very big size datasets by retrieving useful numerical and statistical patterns. It is a composite process of probing big and diversity data sets or big data to uncover information. These types of dataset increase the complexity of the data and thus make the current techniques and technologies stop working as expected within a given process time. Many applications suffer from the Big Data difficulty, including network traffic risk analysis, geospatial classification and business forecasting. Network intrusion finding and prediction are time sensitive applications and they need highly efficient Big Data techniques and technologies to handle the problem. The modern technologies can help to solve Big Data analytics on various applications. The troubles and challenge associated with the modern networking technologies and machine learning techniques can be used to solve Big Data classification problem for network intrusion forecast.

Keywords:Big Data, Data Mining, Intrusion detection, Machine Learning.

I. INTRODUCTION

In the present situation, it is difficult to work without internet. Every person has addiction on internet. It has become an significant model in various applications such as learning, business and others. So security of the data that is communicated through internet is necessary. Securenetwork is maintained by Intrusion Detection System (IDS). IDS observe the data interchange carefully and identify it as normal or spam. Now a day's most of the applications depends on the advance network technologies namely wireless networks, wireless sensor networks and blue tooth. In case of wireless sensor networks security mechanisms such as key-management protocols, authentication techniques and security protocols cannot be used because of resource constraints. Intrusion Detection System is the ideal security method for wireless sensor networks. [1]

Usual Intrusion prevention technique such as firewall, access control and encryption has failed to detect the intrusion in the networks. As a result Intrusion detection system becomes an essential component. The idea of the Intrusion detection system (IDS) is to prevent the computer system from attack. The IDS is the most essential part of the security infrastructure for the networks connected to the internet because various ways to compromise the stability and security of network.

IDS can be classified into two types: Anomaly and Misuse detection. Anomaly detection system creates a database of normal behavior and any deviations from the normal behavior are occurred an alert is triggered regarding the occurrence of intrusions. Misuse Detection system stores the Predefined attack patterns in the database if a similar data and if similar situations occur, it is classified as attack. Based on the source of data the intrusion detection system are classified to Host based IDS and Network based IDS. In network based IDS the individual packet flowing through the network are analyzed. The host based IDS analyzes the activities on the single computer or host. The main disadvantage of the misuse detection method is that it cannot detect novel attacks and variation of known attacks. To avoid these drawbacks we go for anomaly based detection methods. With this approach, known and novel attacks can be detected. The problem is that it will generate more false alarms. The intrusion detection method based on unsupervised learning has a high detection rate but also a high False positive rate [2].

Intrusion detection functions include:-

Monitoring and examining of both user and system activities.

Analyzing system configurations and weaknesses.

Assessing system and file integrity.

Skill to identify patterns typical of attacks.

Analysis of irregular activity patterns.

Tracking user policy violations.

HYBRID SHUNT ACTIVE POWER FILTER HYBRID SHUNT HARMONICS MITIGATION

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Abstract:This project is animated by problems associated with the existence of harmonics in a power supply system. Since the quickgrowth of the semiconductor industry, power electronics devices have obtainedadoration in our day-to-day used electrical house-hold devices. Even if these power electronics appliances have profited the electrical and electronics industry, these appliances are also the principal source of power harmonics in the power system. These power harmonics are called electrical contamination which will reduce the standard of the power supply. As an outcome, filtering procedure for these harmonics is required in order to raise the standard of the power supply. Thus, active power filter appears to be a perfectreplacement for power conditioning to manage the harmonics amount in the power system these days. In this article a union of shunt active filter and a passive filter is used to compensate the THD. (Total order harmonics distortion).

***Index Terms*–Active filter, Harmonics, Passive filter, THD (Total order harmonics distortion).**

I.INTRODUCTION

A. FILTERS USED IN POWER SYSTEM

Existence of harmonics has been a lot since the 1990's and has led to decrease in the standard of power. Harmonics creates due to the non-linear loads.There are some examples of nonlinear loads would beconverters, inverters, etc. There aresome of the examples of electronics equipment's would be computers, scanners, printers, etc. Some of the mainproblems concerned with harmonics in nonlinear loads are overheating, temperature increase in generators, etc. There is only One way for solving these problemsi.e. the use offilters. Installing a filter for nonlinear loads connected in power system would help in lowering the harmonic effect. With the increase of nonlinear loads in the power system, many filters are needed. Passive filters have been most broadly used to restrict the flow of harmonics currents in distribution systems. The idea of active filter is relatively old, but their practical development was made possible with the new refines in power electronics and microcomputer control strategies as well as with cost reduction in electronic components.Active power filters are becoming a practicable alternative to passive filters and are gaining market share speedily as their cost becomes competitive with the passive variety. Through power electronics, the active filters introduce current or voltage components, which cancel the harmonic components of the nonlinear loads or supply lines respectively.Different active power filters topologies have been introduced and many of them are already available in the market. Due to the non linear loads harmonics are introduced in the system [17]. To reduce the harmonics at the source side hybrid shunt active power filter comes to the picture. By using this shunt hybrid active power filter total harmonics reduction is done in this article.

II.STRATIFICATION OF ACTIVE FILTERS

In many technical literatures different types of active filters have been implemented [1],[2]. Categorization of active filters is made from different angel.They are classified into ac filter and dc filter. Active dc filters have been planned to reduce for current harmonics and/or voltage harmonics on the dc side of converters for HVDC systems [3],[4],[5] and on the dc link of a PWM rectifier/inverter for traction systems [6]. Importance however is put on active ac filters in this article because the term 'active filters' mentions to active ac filters in most occurrence.

A. Classification by Objectives: Who is answerable for establishing Active Filters?

The objective of "Who is responsible for installing active filters"classifies them into the following two groups.

1-Active filters installed by individual consumers on their own premises near one or more identified harmonic producing loads.

2-Active filters installed by electric power utilities in substations and/or on distribution feeders.

The principalcause of the active filters installed by individual consumers is to reduce for current harmonic manufacturing loads. At the same time, the keyreason of active filters established by efficacyvery soon is to reduce for voltage harmonics and/or voltage imbalance, or to provide "harmonic damping" throughout power distribution systems. In addition, active filters have the function of harmonic isolation at the utility-consumer point of common coupling in power distribution systems.

A Microwave Radiation Meter's Design and Simulation Using Simulink

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Abstract: Mobile phone technology has many advantages and has grown rapidly in the last decade. In India numbers of cell phones and cell towers are increasing without considering its dark side that is about the associated health risks due to electromagnetic radiation from cell phones and cell towers. The best remedy to fight against these hazards is "Awareness". When people know that they are leading a risky life then only they start to take steps against this hazardous phenomenon. If the power and frequency measuring of these radiations can be easily and cost effectively done by any handy device then rules and restrictions can be imposed over vendors. Also the EMC/EMI measurements can be possible by Microwave Radiation Meter. Here the aim is to design & simulate a Radiation meter and provide idea of various probes which will measure the electric field power and the frequency of radiation.

IndexTerms- Microwave Radiation, Simulink

I. INTRODUCTION

has no smell and invisible, but it may be harmful. Radiations from leaking microwave oven or radiation coming from a WLAN router, mobile phone or a transmitter mast is always harmful to human. To detect the harmful source reliably is very important. In our day to day life we are either using or come across with the Microwave Communication where the basic frequency of communication is in microwave range eg.1GHz to 300 GHz. Though many advantages are there but we have to pay the price by facing severe health challenges due to heavy and extended microwave radiation exposure. As we know that microwave is omnipresent so these radiations may hamper the desired communication due to interference if it has high signal strength. If we can measure and analyze the radiation frequency and its power level then some remedy like gaskets can also be taken. Some standards, regulations and preventive measures can be implemented.

II. BACKGROUND

Microwave radiation broadly classified as Non-ionizing radiation and Ionizing radiation. Those having enough energy to move atoms in a molecule around or cause them to vibrate, but not enough to remove electrons, is referred to as "non-ionizing radiation." Examples of non-ionizing radiations are sound waves, visible light, and microwaves. But radiation that falls within the "ionizing radiation" range has enough energy to remove tightly bound electrons from atoms to create ions. We use its properties to generate electric power, to kill cancer cells, and in many manufacturing processes. We take advantage of the properties of non-ionizing radiation for tasks like:[a]microwave radiation- telecommunications and heating food[b]infrared radiation infrared- lamps to keep food warm in restaurants[c]radio waves broadcasting

Mobile Phone Radiations effects are two types, Thermal and Non Thermal. Thermal effect is like microwave oven heating process. Non Thermal effect is 3 to 4 times more harmful than thermal effects.

SPECTROSCOPIC AND CATALYTIC ACTIVITY STUDIES TO EXPLORE CHROMIUM SITES IN CRAPO-11

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Abstract

A systematic study of the location, oxidation state, stability and activity of chromium in CrAPO-11 is investigated. CrAPO-11 was hydrothermally synthesized and characterized by various spectroscopic techniques, such as X-ray powder diffraction, Fourier transform infrared spectroscopy, thermogravimetric analysis, diffuse reflectance UV-Visible spectrophotometer, electron paramagnetic resonance, N_2 adsorption-desorption, transmission electron and field emission scanning electron microscope and high resolution transmission microscope techniques. Chromium primarily occupies octahedral sites and predominantly present in Cr(III) in as-prepared CrAPO-11. Cr(V) and Cr(VI) along with Cr(III) were detected to be present in CrAPO-11 catalyst. Both Cr(V) and Cr(VI) are unstable and removed during the initial runs of catalytic activity. However, residual chromium sites are stabilized in the matrix and display oxidative ability towards *o*-cresol oxidation.

Keywords: Aluminophosphate, CrAPO-11, *o*-cresol

I. INTRODUCTION

Nanoporous aluminophosphates are a class of inorganic porous solids structurally build up from tetrahedral Al(III) and P(V) with corner sharing oxygen atoms, possess a three dimensional open framework with well defined channels of molecular dimensions [1,2]. Since the first report on microporous (pore diameter < 20 Å) crystalline aluminophosphates in 1982 [3] these materials have attracted considerable attention because of the promising catalytic and adsorptive properties. Among the members of this family, AlPO-11 belongs to AEL topology which possesses unidimensional channels with 10-ring aperatures of ~ 6.3 Å diameter. The adsorption and catalytic behaviour of these materials cn significantly be tuned by incorporation of transition metal ions Si, Co, Zn, Mn, Mg, Cr, Ti and V into the framework [4-6]. In this regard, chromium draws particular attention because of its variable in oxidation states, coordination numbers and molecular structures [7-9] and the role of chromium and/or chromium compounds in homogeneously catalyzed oxidation reaction have been studied since long period [10]. The loss of chromium into the environment and the hazards associated with chromium limits the application of homogeneous catalyst. In recent years, utilization of biomass as a chemical feedstock has gained momemtum with an aim to replace conventional petroleum based industries. Among the biomass studied, lignin based phenolic component possesses most potential as a source of aromatics. Chemically, lignin is a phenyl propanoids. The lignin biopolymer is assumed to be built up from three phenolic monomer such as sinapyl, coumaryl and coniferyl alcohols. Phenols and phenolic derivatives can act as functionalized aromatics for further organic transformations. *p*-cresol, *o*-cresol are some of the model molecules are commonly studied as model molecules to assess and evaluate catalytic potential of catalysts. Over the period, several researchers have developed a spectrum of modified aluminophosphate based materials particularly suitable for variety of organic transformations.

In this report we have undertaken a systematic investigation on synthesis, spectroscopic characterization and evaluation of active sites with an aim to understand the chromium sites in CrAPO-11. Nanoporous CrAPO-11 was prepared by adopting simple hydrothermal synthesis route. Various spectroscopic techniques were employed to probe the chromium sites. Catalytic performance of the catalyst, the role of and stability of chromium sites were studied by conducting liquid phase oxidation of *o*-cresol in presence of TBHP or H_2O_2 as an oxidant. The heterogenous nature of the CrAPO-11 was also investigated towards the chosen reaction.

II. EXPERIMENTAL

2.1 Preparation of CrAPO-11

Microporous CrAPO-11 was hydrothermally synthesized by following the procedure outlined elsewhere[11] having the gel composition;1.0 Al_2O_3: 1.0 P_2O_5: 1.0 DPA: 0.034 Cr_2O_3 : 40 H_2O

2.2 Reactivity Studies

In a typical catalytic run, *o*-cresol, acetonitrile, CrAPO-11 and 35% aqueous hydrogen peroxide (H_2O_2) or tert-Butyl hydroperoxide (TBHP) were placed in a double neck round bottomed flask equipped with condenser and allowed to run for 2-12 h in the temperature range 333 K. To access the stability chromium sites was treated with water, H_2O_2 and TBHP. About 100 mg of the catalyst was stirred with water for overnight at room temperature. Then it was, washed repeatedly, filtered and the residue was dried at 353 K. The filtrate and residue obtained are designated as CrAPO-11F and CrAPO-11R, respectively.

A COMPARISON OF DIFFERENT ALGORITHMS FOR LOAD BALANCING IN CLOUD COMPUTING

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Abstract : In recent era, the Cloud Computing(CC) is a fast-growing domain where new advancements are being done every day. Computing services are provided to users via internet. There are mainly three different kinds of services that is provided over the cloud ie. Software as a service(SAAS), Platform as a service(PAAS) and Infrastructure as a service(IAAS). The service providers will manage all the aspects of cloud services related to implementation, installation, configuration, troubleshooting and the various other issues related to services provided. The service provider of cloud will provide the services based on usage then will charge only for the amount of service used. Cloud computing thus provides flexibility to users on the amount of service to be used and when to use. This paper summarizes various kinds of algorithms in CC on load balancing(LB) along the various options available that relate to simulation of the various LBAs.

***IndexTerms* --Virtual machine, Cloud services, Distributed, Simulators, Cloud-Sim, LBA**

I. INTRODUCTION

In internet environment, Cloud-Computing(CC) plays an important role which mainlyinvolves using web browser on your computer to access the services over the internet. The actual installation and processing is done by remote servers that can be located on some distant computer. There are generally three categories of services on which the CC deals with. These are namely SAAS for eg. Google docs, PAAS foreg. Development platform can be used a service on which software developers can develop their code, IAAS for eg. Servers can be used as aservice.

Basically distributed servers, Data centres and Users are the various entities of CC. The userrequests services and send requests to the data centres. A Data centre is a collection of the different servers which hosts the applications A distributed server is collection of servers which are scattered over the internet and provides access to services. Refer to fig. 1.Now a days there has been a huge demand of the cloud computing services[1] and thus no of clients accessing the services is increasing, so there is a major concern for LB in the distributed servers. Fig. 2 gives the idea of various components of cloud environment. User request to access services is randomly generated hence some nodes might get heavily loaded while some might be lightly loaded. To properly balance the load on virtual machines, the load balancers are used which migrate some load from heavily-loaded virtual-machine to lightly loaded machine.

LBAs may be broadly categorized to Dynamic and Static load balancers. A static algorithm uses predefined information of the system to balance the load of the system. Dynamic algorithms[2] use current state of the system to balance the load of the system. Further there are three ways to dynamic load balancing ie. Global, Cooperative and Non-cooperative. In global method, there is single machine which balances the load of the system. In-cooperative approach, few machines work in a cooperative way to balance the load of the system. In non- cooperative method of load balancing every machine balances its load by its own.

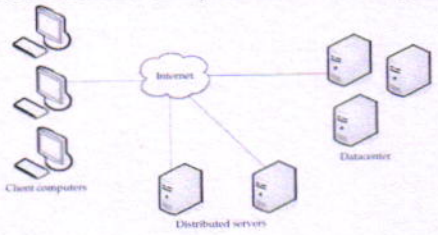

Fig. 1 Cloud Environment

Fig. 2 Basic Cloud components

PYROLYSIS-BASED FUEL GENERATION FROM MUNICIPAL WASTE PLASTIC

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Abstract: Waste plastic in this modern era is abundant in nature and its disposal creates large problems for the environment in our country and also in the world. Global population of plastics, being one of the main contributors of global warming and other natural calamities. The high demand and high price for energy sources are driving efforts to convert wasted organic compounds into useful hydrocarbon fuels which is more convenient and enhanced. Plastic generally doesn't decompose in landfills due to which it is not easily recycled and degrades in quality during the recycling process and thus can lead to production of waste ash, heavy metals which are in the form of carbonous chains, and potentially very harmful gas emissions and intoxicating inhaling gas source if incinerated at high temperatures. To reduce the number of plastics, process of pyrolysis, i.e., thermal degradation in the absence of oxygen can be used. It breaks "Cracks" polymer chains into smaller chains under heat and pressure. Using pyrolysis to extract fuel (crude oil or diesel) from end-of-life plastic is one of the best options after recycling.

Key words: Pyrolysis, Society of Plastic Industry (SPI), Hydrocarbon, Thermoplastics and Thermosetting Polymers

I.INTRODUCTION

Plastics are also called polymers which was invented by Alexander Parkes in the year 1862; the term polymer means a molecule made up by repetition of simple unit that are synthetic organic materials produced by polymerization. They are typically of high molecular mass, and may contain other substances besides polymers to improve performance or reduce costs.

These polymers are made of a series of repeating units known as monomers; therefore polymers can be moulded or extruded into desired shapes. Basically we can classify plastics in two broad categories: thermoplastics and thermosetting polymers.

Plastic is one of the most commonly used materials in day to day life; which can be classified in many ways such as based on its physical and chemical properties like the chemical structure such as shape and size, synthesis process, density, and other properties. In order to assist recycling of the waste plastic, Society of Plastic Industry (SPI) has defined a new resin identification code system that divides plastics into the following seven groups based on the chemical and physical structures which outlooks on the shape and size and applications:

Table1: Seven groups of Plastic on the basis of SPI code, chemical structure and examples

Sl. No	SPI Code	Plastic Types	Examples
1		PET (Poly Ethylene Terephthalate)	Soft drink bottle, Water bottle and Cooking oil
2		HDPE (High Density Polyethylene)	Cleaning agents, Shampoo bottles washing and Showering soaps
3		PVC (Polyvinyl Chloride)	Trays for sweets and Fruits, Food wrapping foils
4		LDPE (Low Density Polyethylene)	Crushed bottles, Shopping bags
5		PP (Polypropylene)	Furniture, Luggage and Toys
6		PS (Polystyrene)	Refrigerator trays, Audio cassettes and Costume jewellery
7		Others: Plastics including acrylic	Polyactic fibres, Nylon, Fibre glass and Baby feeding bottles

IEEE 802.15.4'S PERFORMANCE IN DIFFERENT TRAFFIC PATTERNS

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Abstract : " For low rate wireless personal area networks (LRWPANs), a new standard IEEE is uniquely designed. ZigBee, a low-cost, low-power, wireless mesh networking standard is designed for wireless Automation and other lower data tasks such as smart house automation and remote area monitoring". The low cost allows the technology to be widely deployed in wireless control and monitoring applications. The low power usage allows for a long life with smaller batteries, and the mesh networking provides high quality of being trustworthy in larger range. Due to its low-cost and low-power usage this wireless technology is widely used in House Automation, Smart Energy, Telecommunication Applications, Personal House, and Hospital Care. ZigBee enables new opportunities for wireless sensors and control networks. ZigBee is standard based, low cost, reliable and self healing, supports large number of nodes. It can be used globally. This is easy to deploy because of its long battery life and it is secure. In non-becon enabled mode and under moderate data rate, the new IEEE 802.15.4 standard, compared with IEEE 802.11. It is more efficient in terms of overhead and resource consumption. It also enjoys a low hop delay (normalized by channel capacity) on average. In beacon enabled mode, an LR-WPAN can be flexibly configured to meet different needs, such as link failure, self-recovery and low duty cycle. In both beacon enabled mode and non-beacon enabled mode, association and tree formation proceed smoothly and the network can shape up efficiently by itself. This study has been undertaken to investigate, analyze the performance of IEEE 802.15.4 standard procotol using three different traffics (CBR, Poisson, FTP). We are using NS2 simulator to analyze the performance. Our results show that CBR traffic achieves higher packet delivery ratio (PDR), higher throughput and lower packetloss.
***Index Terms* – ZigBee, Becon enabled, WPAN, NS2.**

I. INTRODUCTION

A wireless network connection such as Wi-Fi allows houses, telecommunications networks and businesses to avoid the process of using cables in a building or between equipment locations though it is very expensive. Using radio communication, Wireless telecommunications networks are administered and implemented. This implementation takes place at the physical level (layer) of the OSI model network structure. We use PAN(Personal area network) for communication among computerized devices, including personal digitalassistants, telephones . This can be used for intrapersonal communication among the personal devices , or for connecting to a higher level network the Internet . A wireless personal area network (WPAN) is a computer network for inter connecting devices centered on an individual person's workspace. WPAN is a PAN carried over wireless network technologies such as: IrDA, Wireless, Bluetooth, Z-Wave, ZigBee

1.1 Body Area Network

The reach of a WPAN varies from a few centimeters to a few meters. A PAN may also be carried over wired computer buses such as USB andFireWire.

a. WIRELESS PERSONAL AREA NETWORK

A wireless personal area network (WPAN) — a network for interconnecting devices centredaround an individual person's workspace. This connections are totally wireless. Wireless PAN is based on the standard IEEE 802.15. Bluetooth and Infrared Data Association are the two kinds of wireless technologies used for WPAN . A WPAN could serve. Many people carry with them WAPAN which serve to interconnect all the ordinary computing and communicating devices It also allows the surgeons to communicate during an operation. A key concept in WPAN technology is known as "plugging in". When any two WPAN-equipped devices becomes very close i.e. within a few kilometres of a central server,they can communicate as if connected by a cable. Another feature of this technology is to enable each device to lock out other selective devices which prevent unauthorized access toinformation.

This WPAN technology is in infant stage and is undergoing rapid development. Proposed operating frequencies are around 2.4 GHz in digital modes. The objective is to facilitate seamless operation among houses or business devices and systems. Each device in a WPAN will be able to plug into any other device in the same WPAN, those are within physical range of one another. WPANs will be worldwide interconnected. Like an archaeologist on site in Greece uses a PDA to directly access databases at the Minnesotan Minneapolis, and to transmit findings to thatdatabase.

DESIGN AND ANALYSIS OF MULTI-BANDPASS FILTERS USING RESONATORS IN THE OPEN LOOP RECENT INNOVATION

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Abstract: As the ongoing popularity of the communication industry is being made rapidly, the necessity of optimized-performing filters is rapidly increasing. These filters applied in RF sections require minimum size, optimized output, easy design and minimum attenuation in pass band and high rejection at reject band. Microwave band reject filters do a crucial job in new multi-communication applications. Open-loop resonators are efficiently and suitably used in band pass filters and band reject filters. Now a days, multi-standard wireless propagation model requires multi-band performing transceivers. Besides the multi-band function, higher output and minimum size are required significance for band pass filters. Open multi stubs are structured enabling transmission zeros which signifies differentiating pass bands. Stepped-impedance resonators (SIRs) are applied for designing dual-band pass filters by minutely comparing impedance proportion and electrical length of SIRs. In this paper, multi-band band pass filter is being proposed using multi-reject band resonator. The relevant concept and new designs of filters are being introduced with relevant facts using HFSS software.

New Design Description:

I. (Design of a single armed resonator having an opposite armed pair structure)

In this design, a single armed resonator is designed with an opposite arm pair. The required filter is designed by using Ansoft HFSS software and is implemented on the substrate with relative dielectric constant of 3.38 and thickness of 0.813 mm.

Filter characterization

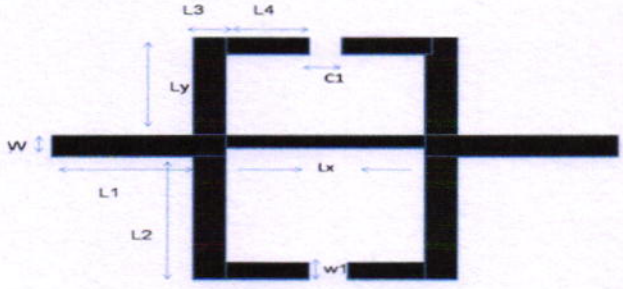


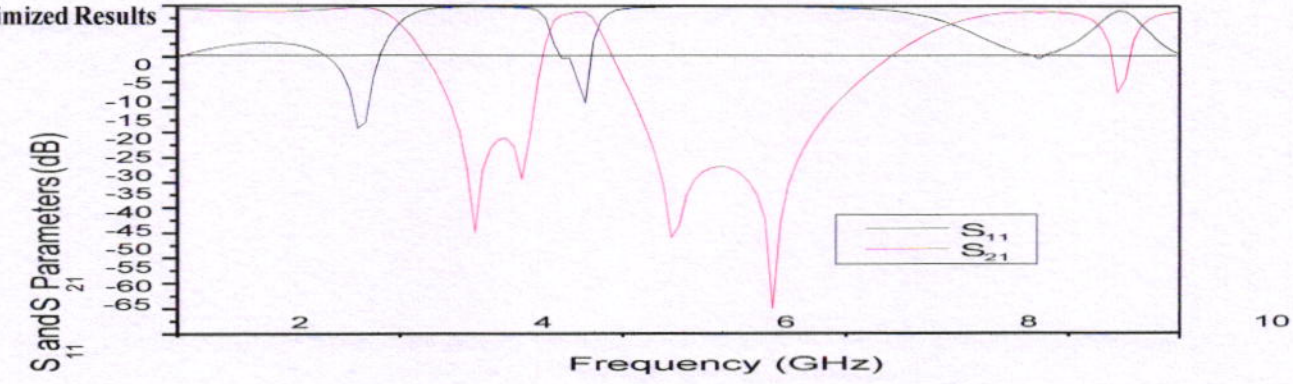
Figure 1 (a) Geometry of a single armed resonator having an extra opposite arm pair

In addition to the original single arm pair resonator, an opposite arm pair is designed. The required dimensions of the filter are as follows: L1= 8 mm, L2= 9.3 mm, L3=1mm, L4=2.52 mm, Lx=6mm, Ly=6.7 mm, w = 1.92 mm, w1=1 mm, c1= 0.96 mm. Designs of the proposed multi-band pass filters are designed on Neltec NH9338 (tm) substrate.

Simulated Results

An opposite armed pair performance is designed, and measured. It is applied on a substrate with relative permittivity of 3.38 and thickness of 0.813. Some exceptions between simulated and measured results may be due to unexpected tolerances in fabrication, material parameters and soldering.

Optimized Results



A single transmission band is resulted for a single arm pair with another opposite armed pair resonator.