

METHODIST

College of Engineering & Technology

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College Code : 1607

3.3.3 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during the Academic year : 2020-2021										
Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
1	Dr. M Udaya Kumar	A Novel analysis and developments in Heat Exchangers	NA	NA	NA	International	Aug-21	ISBN: 978-620-4-20415-4	lambert academic publishing	lambert academic publishing
2	Dr. M Udaya Kumar	NA	Comparative study of Plain and Twisted ducts in Heat transfer	(Springer) Comparative study of Plain and Twisted ducts in Heat transfer	3 rd International Conference on Intelligent Manufacturing and Energy Sustainability	International	June 18-19, 2021	ISBN:978-981-16-6481-6 e-book ISBN 978-981-16-6482-3	NA	<u>Intelligent Manufacturing and Energy Sustainability</u> <u>Smart, Innovations systems and technology</u>
3	Saigayathri lahari .P	NA	Experimentation and study of Abrasive water jet cutting of AA 6061	Experimentation and study of Abrasive water jet cutting of AA 6061	Journal of the Maharaja Sayajirao University of Baroda Turn	National	May-21	ISSN :0025-0422	The Maharaja sayajirao University of Baroda	Journal of the Maharaja Sayajirao University of Baroda Turn
4	Saigayathri lahari .P	NA	Experimentation and study of Metal Spinning of pure copper by using Taguchi methodology and Regression analysis	Experimentation and study of Metal Spinning of pure copper by using Taguchi methodology and Regression analysis	The Journal of oriental Research Madras	National	Aug-21	ISSN : 0022-3301	The kupuswamy sastri research Institute, Mylapore Madras	The Journal of oriental Research Madras

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5	Dr. M. Sharada Varalakshmi	ICACECS-2020	Prediction of Anaemia disease using classification Methods	International Conference on Advances in Computer Engineering and Communication systems	ICACECS-2020	International	2020	DOI:10.1007/978-981-33-4046-6_1	Methodist College of Engineering and Technology	Springer Proceedings
6	Dr.B.L.P.Swami	IWCASME 20	Experimental study on the influence of the presence of mineral admixtures and steel fiber on the elastic properties of self-compacting concrete	Experimental study on the influence of the presence of mineral admixtures and steel fiber on the elastic properties of self-compacting concrete	IOP Conference series:Material Science and Engineering	International	Nov-20	https://iopscience.iop.org/article/10.1088/1757-899X/983/1/012011/meta	Methodist College of Engineering and Technology	IOP Publishing
7	Dr.Bandita Naik	Impact of Climate Change on Hydrological Parameters	Impact of Climate Change on Hydrological Parameters	Climate Change Impacts on Water Resources	NA	International	Aug-21	SBN 978-3-030-6420-3 ISBN 978-3-030-64202-0(e Book)	Methodist College of Engineering and Technology	Springer International Publishing
8	A.Madhusudhan	Advancement in Engineering and Management	River modelling using HEC-RAS	River modelling using HEC-RAS	NA	National	May-21	ISBN: 978-93-91193-01-0	Methodist College of Engineering and Technology	Manglam Publications
9	Dr.A.Arun kumar	Ammonium Dihydrogen phosphate doped potassium sulphate single crystals	NA	NA	NA	International	2021	ISBN (978-620-3-85675-0).	Methodist College of Engineering & Technology	Lambert Academic Publishing: OmniScriptum GmbH & Co. KG, Germany,
10	Dr.A.Arun kumar	Sodium para nitrophenolate para nitrophenol (SPPD) Optical Single Crystals	NA	NA	NA	International	2021	ISBN (978-620-3-85504-3)	Methodist College of Engineering & Technology	Lambert Academic Publishing: OmniScriptum GmbH & Co. KG, Germany,

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11	Dr.A.Arun kumar	Injection Molded Vetiver–polypropylene (PP) Composites	NA	NA	NA	International	2021	ISBN (978-620-3-85556-2)	Methodist College of Engineering & Technology	Lambert Academic Publishing: OmniScriptum GmbH & Co. KG, Germany,
12	Jarapala Ramesh Babu	Electric Vehicle Adoption to Revolutionize Automobile Sector	NA	NA	NA	International	2021	ISBN 978-1-956102-55-0	Methodist College of Engineering & Technology	IIP Publishing house
13	Dr. Prabhu G Benakop	NA	Design of an AAM 6T-SRMCell Variation in the supply voltage for low power dissipation and high speed applications using 20nm finfet technology	2020 International conference on inventive computation technologies	ICICT	International	2020	ISBN:978-1-7281-4685-0	Methodist College of Engineering & Technology	IEEE
14	Dr. Prabhu G Benakop	NA	Energy efficient MAC protocol with wake up radio for wireless network	2020 International conference on inventive computation technologies	ICICT	International	2020	ISBN:978-1-7281-4685-0	Methodist College of Engineering & Technology	IEEE
15	Dr. Ravi M Yadahalli	IoT and Cloud based VANET	NA	NA	NA	International	2021	978-1-119-76183-9	Methodist College of Engineering & Technology	Wiley
16	Dr. Ravi M Yadahalli	Slot loaded Capacitive fed suspended RMSA	NA	NA	NA	International	2021	978-93-91882-89-1	Methodist College of Engineering & Technology	BP International

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17	Mrs.Rani Rajan	Indian Start-up Ecosystem-opportunities and challenges	Organisational knowledge and innovation management-western vs japanese perspective	Indian Start-up Ecosystem-opportunities and challenges	Indian Start-up Ecosystem-opportunities and challenges	National	2021	ISBN 9789389652628	Methodist College of Engineering & Technology	Himalaya Publishing House
18	Ms. A.Swathi	Post Pandemic Economy - Challenges & Solutions	Impact of Covid on Banking Sector	Post Pandemic Economy - Challenges & Solutions	NA	National	2020	9789388808965	Methodist College of Engineering & Technology	Paramount Publishing House

Criteria Incharge



Principal



The present work experimental and simulation investigations have been carried out to study heat transfer, friction factor characteristics of a plain and twisted square ducts, with and without inserts. The experiments are performed for the airflow rate through the tested duct fitted with inserts for Reynolds number varied from 8000 to 40000. To reduce pressure drop and enhance heat transfer, twisted square duct is newly introduced without previous research available. The investigational work has been carried out and the experimentation is completely based upon design of experiments to get the optimum heat transfer rate and lesser pressure drop. Therefore the various process parameters studied are: temperature, velocity, mass flow rate, duct geometry, and shape of inserts. The pertinent parameters of tested duct elements include circular rod inserts, twisted shape square duct with twist ratio 6.12. Influences of these parameters on heat transfer and energy loss due to friction are studied in terms of Nusselt number and friction factor. It seems that twisted square duct is more potentiality in terms of heat transfer due to higher turbulence and twisted shape. It is observed



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A Novel Analysis and Developments in Heat Exchangers

Heat Exchangers



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M.Udaya Kumar

A Novel Analysis and Developments in Heat Exchangers

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Smart Innovation, Systems and Technologies 265

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Intelligent Manufacturing and Energy Sustainability

Proceedings of ICIMES 2021



 Springer

Chapter 54

Comparative Study of Plain and Twisted Ducts in Heat Transfer



M. Udaya Kumar and Gadi Karthik

Abstract The experimental and simulation investigations are meted out to review heat transfer, friction characteristics of twisted and plain ducts. In the present work, Reynolds number varied from 7000 to 40,000 the flowing fluid is considered as air. Twisted duct is a new invention to reduce pressure drop and also increases heat transfer. The practical work has meted out and also experimental setup depends on plan of investigations to induce the best possible warmth transmit and less significant in pressure fall. Then, numerous parameters are such as: hotness, flow rapidity, mass flux, inserts. Twisted ratio of the duct is considered as 6.12. All values and analysis are considered in terms of Nusselt number and Reynolds number and friction factor. The outcome of the experiment shows that twisted duct Nusselt number shows 1.90 times more than the plain duct and also thermal performance of the twisted duct is obtained as 1.43. In this current work, numerical simulations are performed by using ANSYS 18.2FLUENT. In the present work hotness transmit, statistical flow patterns like heat transmit, frictional resistance graphs of twisted and smooth ducts are studied.

54.1 Introduction

Heat exchangers are mechanical appliance to pass on warmth power from one section to a different one by the use of exterior region. Al Mudhafa et al. [1] numerically investigated about new modified webbed heat exchanger, and these

Please note that the LNCS editorial assumes that all authors have used the western naming convention, with given names preceding surnames. This determines the structure of the names in the running heads and the author index.

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EXPERIMENTATION AND STUDY ON METAL SPINNING OF PURE COPPER BY USING TAGUCHI METHODOLOGY AND REGRESSION ANALYSIS

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Abstract

The main purpose of the present work Metal spinning experimentation is to produce low cost rapid prototypes, as it consumes less duration and best economy. This study intends to define the critical parameters of spinning and optimize them using pure copper as the workpiece material. Design of experimentation is calculated using Taguchi methodology. The thickness of the workpiece, speed of the mandrel and the roller feed were considered as the three main spinning parameters. Regression model is framed by using statistical tool and analysis is done to compare the predicted values with the experimental results. In the present work to findout the optimum conditions and required components with good hardness and better surface finish.

Keywords: Metal spinning, Hardness, Surface Roughness (SR), Regression analysis, Taguchi methodology

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1. Introduction

Spinning is the process used for making cup shaped articles which are axi symmetric. The process of spinning consists of rotating the blank, fixed against the form block and then applying a gradually moving force on the blank so that the blank takes the shape of the form block. The machine is same as lathe in the head stock, form block which has the shape of the desired part is fixed. The blank is held against the form block by means of the freely rotating block from the tail stock. After proper clamping the blank is rotated to its operating speed. The spinning speed depends on the blank material, thickness and complexity of the desired cup. Then roller type metallic tool is pressed and moved gradually on the blank so that it conforms to the shape of the form block. [1]. To produce a closed component, a spun shell could be made into halves which can be later welded to form a single unit without any complex or expensive tooling. Due to the nature of the metal spinning process, its products are limited to those with concentric, axially symmetric shapes such as hemispheres, cones, funnels, flanged covers, parabolas, stepped parts and dished heads. Moreover, the size of the available metal spinning equipment limits the maximum practical diameter of the components produced. Localized deformation of the material under the roller requires low forming forces. Moreover, simple and non-dedicated tooling provides flexibility and has the potential for net shape forming. Lastly, formed components have a high quality surface finish and improved mechanical strength [11]

2. Literature review

The sheet metal spinning process has been frequently used to produce components for the automotive, aerospace, medical, construction, and defense industries. In recent years, novel spinning processes are being developed which challenges the limitation of traditional spinning technology being used for manufacturing axisymmetric, circular cross-section, and uniform wall-thickness parts [2, 4]. Xia [5] developed a 3D non-axisymmetric spinning process, in which the workpiece was free from the rotational motion during processing and the roller set was installed on the main spindle and rotated together with the main spindle of the machine. Kalpakcioglu proposed an idealized model to analyse the shear forming process whereby the disc

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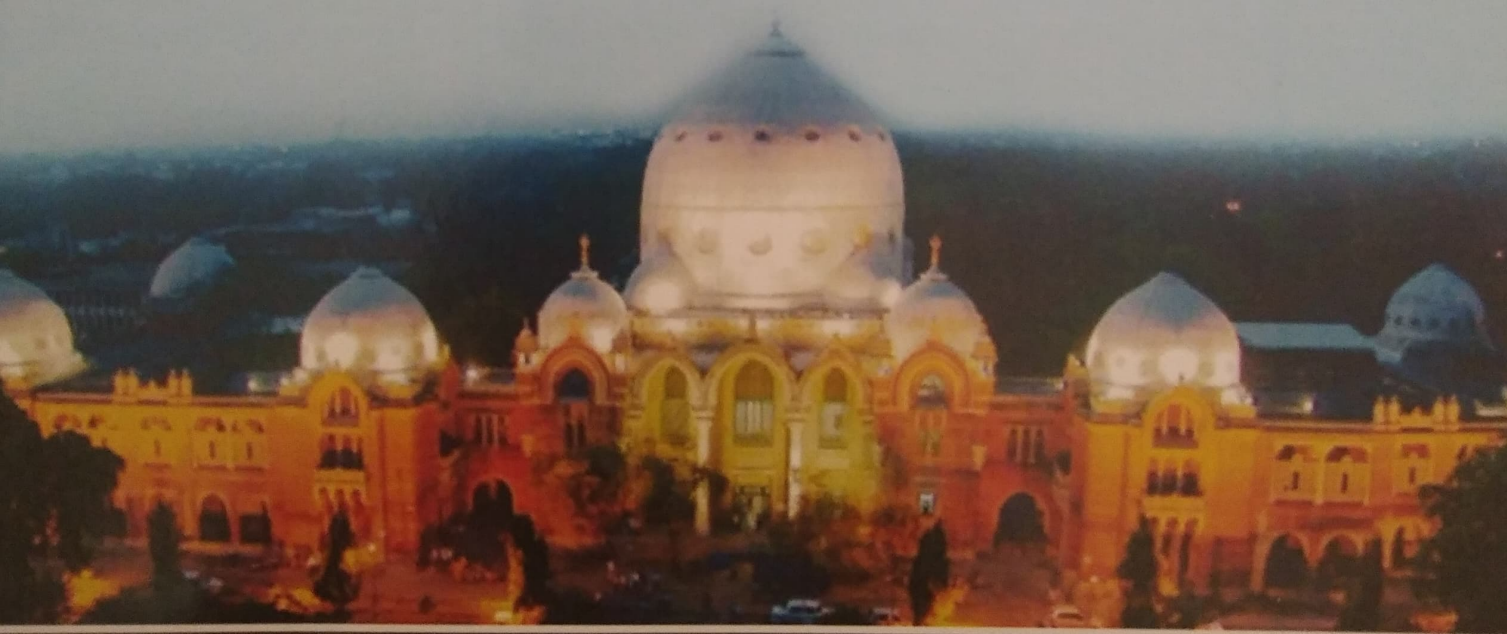
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Abstract

In advanced areas of space, missile and nuclear technologies, there arises a need for machining components to maintain exact sharp edges, high accuracy. In the present era of modern machining, these requirements can be achieved with the help of advanced machining processes like Abrasive Water Jet Machining. In the present work the Design of Experiments which are calculated by Taguchi techniques and experiments are conducted in varying process parameters such as Carrier fluid pressure, Abrasive flow rate, Speed/Feed rate, Thickness of workpiece on Material Removal Rate (MRR) and Surface Roughness (SR). The generated regression equation is used to predict the values MRR and SR for various settings and is compared with the experimental results. Better surface finish is achieved through this experimentation at the optimum cost of MRR.

Keywords: Abrasive water jet machining, Material Removal Rate(MRR), Surface Roughness (SR), Regression analysis, Taguchi method

1. Introduction

The mechanism of any machining process evolves to acquire dimensional accuracy, better surface finish with optimum cost. The term abrasives are used in machining processes such as abrasive jet machining, abrasive flow machining and ultrasonic machining, but usage of abrasives differs based on area of work. In AJM air is driven with abrasive to strike the work piece while in USM abrasive grains in liquid slurry strikes the work piece at ultrasonic frequency. Recently developments were processed in jet cutting technology by using abrasive water jets with water as a carrier fluid. In abrasive water jet (AWJ) cutting technique, a thin, high velocity water jet accelerates abrasive particles that are directed through an abrasive water jet nozzle at the material to be cut.[10]

The main aim of this work is to reduce the defects in AWJM such as taper in kerfs, surface finish etc., The mechanism and rate of material removal during AWJ cutting depends both on the type of abrasive and on a range of process parameters.

2. Literature review

A lot of experimental and theoretical research was carried out on single objective functions. Usharta aich has published a paper on "Abrasive water jet cutting of Borosilicate Glass" [1] in which they have used particle swarm optimization technique to optimize the process parameters. They considered Water pressure, Abrasive flow rate, Traverse speed, Standoff distance as process parameters and depth of cut as performance measure. M.chitirai pon selvan worked on "Assessment of process parameters in AWJC in stainless steel"[2]. They used regression analysis to assess the process parameters i.e. Traverse speed, abrasive flow rate, standoff distance, water pressure and considered depth of cut as a performance measure in cutting stainless steel. Aleberdi and four others did an experimental study on abrasive water jet cutting of CFRP stacks for drilling operation[3]. They used ANOVA technique to study the process parameters i.e. Traverse speed rate, orifice, focusing tube diameter, abrasive flow rate, water pressure and the performance measures as kerf profile, taper angle, surface roughness K.S.Jai Aultrin and two other has did modelling the cutting process and cutting performance[4] in AWJM using fuzzy logic genetic algorithm in which water pressure and nozzle exit

Prediction of Anemia Disease Using Classification Methods



Sagar Yeruva, B. Pavan Gowtham, Yendluri Hari Chandana,
M. Sharada Varalakshmi, and Suman Jain

1 Introduction

A Normal Blood flows through a small circular shape which carries oxygen to organs of human body parts which is circular in shape and the life span of each cell is approximately 120 days and a new blood cell is generated for every 120 days [1]. SCA is a kind of abnormal blood disease which affects hemoglobin within the RBCs. The shape of the sickle cell is disc shape which is sticky and rigid, which causes stoppage of blood flow in the human body. It is also observed that the life span of sickle cell is 10–20 days [2]. Due to the presence of sickle cell in hemoglobin, it may cause severe episodes of pain, death of tissue, and serious complications, in some cases it may lead to death [3].

In above Fig. 1, we can clearly see that the normal blood flow passing oxygen to all parts without stoppage of blood, where sickle cell shape is sticky and due to that blood flow will stop at any stage. Due to the stoppage blood flow may cause severe body pains and heart strokes, etc. Sickle cell was observed in the black population, later it has been observed in other ethnic group, which includes Middle East, Mediterranean

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Experimental Study on the Presence of Mineral Admixtures and Steel Fiber on the Elastic Properties of Self-Compacting Concrete (SCC)

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Zhonghua Li, Wei Gao, Keke Li et al.

Experimental Study on the Presence of Mineral Admixtures and Steel Fiber on the Elastic Properties of Self-Compacting Concrete (SCC)

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ABSTRACT: The elastic properties like young's modulus and poisson's ratio are critical issues in the design of concrete structures. This technical paper focuses on the influence of the mineral admixtures like flyash and condensed silica fume along with percentage of steel fibers on the compressive strength and elastic properties of self-compacting concrete (SCC). The flow ability, passing ability along with the segregation resistance tests were conducted. Designed the M40 grade of SCC as per American concrete institute (ACI) provisions. The cement is mingle with flyash(FA) at 20% and condensed silica fume(CSF) at 10% as partial replacement by weight. The steel fiber of diameter 1mm and aspect ratio of 40 mixed at 0.2, 0.4, 0.6, and 0.8 percentages by volume of the concrete. The Young's modulus and Poisson's ratio are resolved as per American standard for testing materials (ASTM) specifications. Based on the experimental investigation, conclusions drawn on the contribution of mineral admixtures and steel fiber on the compressive strength and elastic properties of SCC. A mathematical model developed and checked the validity of the equation with the experimental results.

Keywords: Aspect ratio, Condensed Silica Fume, Chemical admixtures, Poisson's ratio, steel fibers, Young's modulus.

1. Introduction

The structural strength of the concrete is mainly dependent upon the mix design, physical, and chemical properties of the ingredients. Compaction and curing also influence the hardened properties. Self-Compacting Concrete (SCC) defined as concrete material which doesn't require any external compaction for formation of dense mix. This type of special concrete is mainly used for placing in dense reinforcement where compaction is difficult. The SCC is also used in casting of thin concrete structural elements like plates and shells. SCC developed in Japan in late 90's. Initially Okamura, Ouchi, and Ozawa investigated this special type of concrete. Later many researchers carried out the experimentation on the rheological behaviour, structural properties etc. The researchers also studied the influence of admixtures on the structural properties along with the addition of fibers in it. Basically concrete is strong in direct compression, by adding fibers in the concrete matrix the tensile and flexural strengths were improved. But the percentage of these fibers in SCC depends upon their physical properties. For steel fibers it is limited to a particular percentage of volume of the concrete, so as to avoid the obstruction of flow ability. By adding admixtures to the concrete, the properties in fresh stage are not only improved, but the strength properties in the hardened stage also enhanced. The chemical admixtures like superplasticizer (SP) improves the flow ability of the concrete. The viscosity modifying agent (VMA) modifies the segregation resistance. The percentage of these admixtures depend upon the properties of the ingredients used in the mix.

2. Literature review

In late 90's Okamura.H, along with his team of scientists developed the ideology of SCC. This type of the concrete developed at that time for better strength and durability by using supplementary



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39. Impact of Climate Change on Hydrological Parameters

Authors: Arunima Priyadarsini Patnaik, Bandita Naik

Publisher: Springer International Publishing

Published in: Climate Change Impacts on Water Resources

Abstract

The increasing rate of global surface temperature is going to have a significant impact on local hydrological regimes and thus on water resources; this leads to the assessment of water resources potential resulting from the climate change impacts. The main parameters that are closely related to climate change are temperature, precipitation and runoff. Therefore, there is a growing need for an integrated analysis that can quantify the impacts of climate change on various aspects of water resources. Quantifying the impacts of land-use change and land cover practices on the hydrological response of a watershed have been an area of interest for hydrologists in recent years as this information could serve as a basis for developing sound watershed management interventions. The degree and type of land cover influence the rate of infiltration, runoff, and consequently the volumes of surface runoff and total sediment loads transported from a watershed. It often results in significant degradation of land resources such as loss of soil by erosion, nutrient leaching and organic matter depletion. However, very few studies in India have used the physically-based hydrological models along with the land use/land cover change conditions. Hence in this current work SWAT model has been used to assess the impact of LU/LC changes on daily and monthly streamflow of Mahanadi River Basin of Sambalpur region. The results of the study indicated that the though land-use patterns have changed, resulting in an increase in agricultural, barren and buildup land and decrease in forest cover leading to an increase in the runoff, but changes have not occurred as significantly as the changes in annual streamflow. However, the number of days of high-intensity rainfall has increased over a decade, which, along with the land-use changes, explains the increase in streamflow.

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River Modelling Using HEC-RAS Software (Case Study on Madhira to Keesara)

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ABSTRACT

River Modelling is equipped with, to find out the unknown parameters like depth of the river, water quality analysis, velocity of the flow, etc.; river modelling is done mostly in flood prone areas where the rate of flow is very high. Hydrological factors like size and shape of the river, discharge, steady and unsteady flow of river waves, rainfall on the river basin, temperature, and type of soil, land use and topographical data play an important role in hydraulic modelling for a river flow. This work deals with the The application and focus of river modeling as part of flood relief systems from River Madhira to Keesara. After a brief overview the equations used for steady and unsteady simulations, collection of hydrological and topographical data is discussed. A one dimensional hydraulic model from river Madhira to Keesara flow was developed. The model was calibrated for river flow measurements for an observed 1 year timeframe. HEC-RAS 4.2 was used to model river flow which is based on the geometry and steady flow.

Keywords: River Modelling, HEC-RAS, Topography, Hydrology.

Introduction

A model reflects an idealization of the actual situation. Every model is ideal, but the main aim of modeling is to ensure that the representation is appropriate for the use. Models in river basin were used to help develop equitable and fair long-term agreements and/or short-term plans for water sharing in transboundary basins. A model of river basin describes mathematical processes in a river basin, which can predict the behavior of a basin under various conditions or management perspective.

The single crystal of 2 wt% ADF doped K_2SO_4 crystal was synthesized and white coloured good optical quality single crystals were grown deionized water as solvent by slow evaporation solution growth technique at room temperature. From the single crystal XRD, the doped K_2SO_4 crystal belongs to orthorhombic system, from the powder XRD, appearance of sharp and well defined Bragg's peaks confirmed the crystalline nature of the grown crystal. The doped K_2SO_4 crystal is active in the UV-Vis region and it has good transparency of about 70% with lower cut-off wavelength 380 nm. The band gap of the crystal is found to be 4.8 eV and the calculated refractive index is found to be 1.37 at 532 nm, from the microhardness, the hardness value found is to be $n = 3.1$, that the crystal belongs to soft material category. The SFG efficiency of doped K_2SO_4 is 0.268 times greater than that of KDF. It is found that the conversion efficiency of the doped crystal is greater than pure K_2SO_4 .



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Ammonium dihydrogen phosphate doped potassium sulphate single crystals



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Crystals find their applications in almost every branch of science such as semiconductor lasers, photo electric, ferro electric and IR sensitive crystals and crystalline thin films, photo voltaic cells, photo refractive non linear optical crystals and computer industries etc. hence in the material world, the growth of crystals has become unavoidable for future upliftment. NLO coefficients demand good quality single crystals which exhibit large NLO coefficient coupled with improved physical parameters. However, the organic crystals are demerited in terms of poor chemical stability, mechanical strength and performance at low and high temperatures. The above mentioned disadvantages of the organic crystals can be minimized with the help of metal organic crystals which share the properties of both organic and inorganic materials. Hence, the search of novel, superior crystals are never ceasing. In the present work, MLO active single crystals of SPPD has been successfully grown and their characterization has been studied.



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SODIUM PARANITROPHENOLATE PARANITROPHENOL(SPPD) OPTICAL SINGLE CRYSTALS

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A composite material is a combination of two or more materials arranged in the form of layer one on one the other layer using binding material through some prescribed methods. In the carbon fiber vetiver fiber human hair hybrid composite method, the epoxy resin is used as binding material, in which one layer is formed of carbon fiber, followed by vetiver fiber and then by human hair. By using hand layup method and by changing the above arrangement of the layers, using the resins of DGEBA and hardener HY 951. Carbon fiber laminated hair significantly influenced the mechanical properties.



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Injection Molded Vetiver- polypropylene (Pp) Composites



Electric Vehicle Adoption to Revolutionize Automobile Sector

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Design of an AAM 6T-SRAM Cell Variation in the Supply Voltage for Low Power Dissipation and High Speed Applications using 20nm Finfet Technology

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Abstract

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- II. RELATED WORK
- III. Working of AAM-6T-SRAM leaf cell
- IV. RESULT AND DISCUSSION
- V. Conclusion

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Abstract:
In the present digital technology world, Static Random Access Memory (SRAM) plays a vital role in providing memory storage for sensitive devices. In this paper, AAM is required to manage the entire 6T-Static Random Access Memory leaf cell design. The aim of proposed work Auto Awake Mode 6T-SRAM-(AAM-6T-SRAM) design is to reduce power employment in read and write operation and also to decrease the delay using 20nm Finfet Technology. The simulation results are obtained in the proposed AAM-6T-SRAM design by varying the power supply to decrease power utilization of RD & WR respectively. This decreases the delay, which means speed enhancement but the area remains constant, these parameters are carried out by using Mentor Graphics tools.

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Abstract:

Wireless Sensor Network (WSN) performance is improved with duty cycled Medium Access Control (MAC). However, many MAC variants still suffer from the problems related to idle listening and overhearing. Thus they are short of optimal energy efficiency which is one of the crucial aspect in WSN for increasing lifetime of nodes. It is observed from the literature that Wake-up Radio (WuR) systems can significantly reduce the problems aforementioned. WuR can be used to optimize performance as it switches off node's MCU (Micro Controller Unit) and also the main radio transceiver until a low-power receiver is triggered by a specific wireless transmission. Most of the existing WuR studies are either theoretical in nature or depended on custom-built simulators. In this paper we proposed a framework based on WuR for better performance and reduce energy consumption. It throws light into energy and delay tradeoffs and the empirical results with NS2 simulations revealed the utility of the proposed framework.

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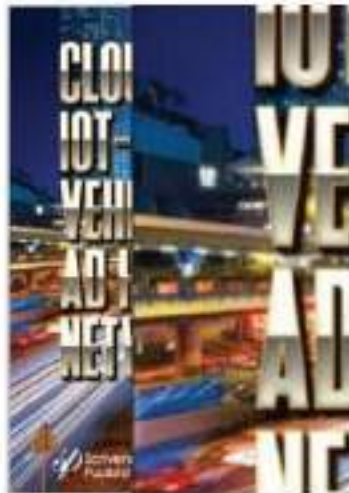
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Feedback



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Slot Loaded Capacitive Fed Suspended RMSA with Meandered Ground Plane: A Recent Study

Nandini M. Ammanagi^{1*} and Ravi M. Yadahalli²

DOI: 10.9734/bpi/naer/v14/3758F

ABSTRACT

Variations in capacitive fed suspended RMSA systems are proposed in this research. Initially, the reference antenna consists of a rectangle patch measuring 35.5 X 45.6 mm² and a small rectangular feed patch measuring (1.4 X 4) mm² both of which are suspended above the ground plane on the same substrate. Probe feed or coaxial feed is popular and widely used in MSA as it can feed the patch at any arbitrary position without much difficulty. The small patch is fed with a coaxial probe, which electromagnetically excites the radiator patch, resulting in a large impedance bandwidth (BW) of 39 percent, strong gain and a broadside radiation pattern. The prototype antenna was created by meandering the ground plane of the reference antenna with three rectangular slots, and measurements were taken to validate the outcome for compact broadband response. The prototype antenna was then created by loading a pair of rectangular slots in the radiating patch of the reference antenna in addition to the rectangular slots in the ground plane, and measurements were taken to validate the result for compact dual band response.

Keywords: Coupled capacitive feed; dual band; electromagnetically; meandering slots; Rectangular Microstrip Antenna (RMSA); Reference Antenna (RA); slot loaded.

1. INTRODUCTION

Microstrip Antennas (MSAs) are popular because they are employed in most wireless communication systems and provide number of benefits. However, the limitation of its narrow bandwidth (BW), it is not suitable for use in many wideband communication systems. Though there are other methods [1] for increasing bandwidth, one is to increase the thickness between the patch and the ground plane.

Probe feed, also known as coaxial feed, is a popular and commonly used method in MSA because it allows the patch to be fed at any arbitrary point with no trouble. However, when the height of the substrate rises, the inductance associated with the probe length may cause an impedance mismatch that cannot be avoided. This impedance mismatch can be addressed by incorporating slots into the microstrip patch, altering the form of the probe, or employing a novel feed approach such as capacitive or proximity fed patch [2-3]. A capacitive fed MSA proposed in [2] provides a wide bandwidth of 50% for C band at 5.9 GHz with RT Duroid substrate (RO3003) having $\epsilon_r = 3.0$ and thickness of 1.56 mm. Also, antenna can be made to resonate at any frequency in L, S, C or X-band by optimizing the design parameters.

Increase in the bandwidth of MSA due to increase in the height of the substrate or decrease in ϵ_r of the substrate both result in the reduction of the resonant frequency of MSA which in turn reduces the antenna size. As reported in [4-5], the meandering technique (embedding slots) in the antenna's ground plane proved to be an efficient method of reducing the size and enhancing the bandwidth of MSA. Variations in slots in radiating patch and ground plane were analyzed for compact and

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Indian Start-up Ecosystem

- Opportunities and Challenges



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Post Pandemic Economy - Challenges & Solutions

Editors

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Impact of Covid-19 on Banking Sector

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Introduction

Corona virus is spreading and risking the lives of people globally, it has also created a deep economic distress. Most of the companies are facing their revenues and profits getting impacted. There is no doubt that COVID-19 is one of the biggest global events in our life. It has brought unprecedented challenges to many industries, governments and people all over the world. The pandemic is still a health and humanitarian crisis, with profound and far-reaching effects on business and the economy. Financial services companies in particular have the opportunity to help consumers and businesses with the economic downturn.

Impact of Covid-19 on Banking Sector

A lot of work has been done. Banks in India are focused on maintaining key personnel in branches and have temporarily relocated personnel to manage customers' online or telephone enquiries. They also deployed mobile ATMs and implemented door-to-door banking for seniors and other customers who need more attention. We expect financial companies to implement video collaboration tools, new chat and messaging software, and other fintech innovations to continue real-time interaction with customers who have followed the social distance specification, some of which have used ordinary consumer applications for this purpose.

Over the past few years, several banks have invested in technology and digital conversion. However, many of these tools still rely heavily on face-to-face interactions supported by the paper process. Therefore, we expect that the Indian financial services industry will energize and banks will work together to enhance their digital meets. This is crucial because COVID-19 may have a long-term impact, and banking business touches all aspects of our economy.

Most banks have solved the direct challenges of COVID-19. These challenges involve protecting employees and providing customers with much-needed services. Now they have the opportunity to become active participants to help alleviate the crisis. They can focus on three key areas to help cope with the current situation.

Client Service and Advice

Due to social alienation, more and more consumers are using online banking channels to manage their funds. This can result in customers preferring to permanently switch to digital channels

and increase demand for digital services. It is important that all consumers (including the elderly or those unfamiliar with digital banking) have access to the bank, provide education on the use of digital tools, and maintain inventory and service of ATMs. As clients seek help and advice on short-term cash management and planning for their future, banks should prioritize live interactions through video collaboration tools. This increase in digital customer engagement must go hand in hand with an increase in cybersecurity and fraud protection tools to protect customers.

Credit Supervision

Even with the Indian government's stimulus plan and the Reserve Bank of India's (RBI) liquidity measures, banks can expect loan default rates to rise, as borrowers from various client groups face the economic crisis caused by customers' business and job losses. Still struggling to repay. In addition to all the term loan suspension measures announced by the Reserve Bank of India, as part of the COVID-19 plan, lenders should also consider actively restructuring loans to reduce the cash flow burden in the short term, thereby reducing recent defaults. The industry must work together to make the financial relief process quick and easy to deploy. Banks should proactively initiate forbearance and loan modification programs using a data-based approach to understand which customers need help, and then quickly contact tailored, appropriate solutions. Even with these programs, some customers may still not be able to make the next payment. Banks should therefore prepare for losses and build the capacity to cope with the increase in credit arrears. As consumer demand increases, although gradually, after blocking, banks will have to change the purpose of their model to market and acquire customers, remembering the changing consumer behavior after COVID-19, as well as focus on digitally native travel and look again at norms insurance to better discover the risk.

Income Firmness

Income from retail and commercial banking is falling sharply as core consumption and transactions have fallen sharply. While central banks around the world are lowering interest rates, banks are lowering returns to generate business, thereby significantly reducing net interest margins. Income from payments and other paid services is experiencing a general decline in economic activity. Due to measures such as loan moratorium periods, banks' cash flow has also suffered. An overall decline of 10% in banks' payment income, which means a \$ 150 billion decline in the global industry because demand in sectors such as retail and entertainment is falling sharply or moving to online channels, while activity in areas such as tourism and travel They evaporate.

Conclusion

COVID-19 will have a long-term impact on many industries, including banks. After the crisis, digital maturity and COVID-19 resilience will determine the strategy of bankers with three

ABOUT THE EDITORS



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