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Authors: Ashab Uddin, Debangshu Barua, Md. Emran Husain, Md. Saiful Amin

Paper Title: Feasibility Study of IGCC Power Plant in Bangladesh

Abstract: The integrated gasification combined cycle (IGCC) is one of the advanced clean coal power generation systems. It could replace many of the contractual high-cost rental power plants and small Industrial Power Plants which are being currently used to supply large amount of population and thereby secure the nation's energy supply well into the future. However, utility companies have been reluctant to make gasification a major component of their generation portfolio due to high capital costs and the lack of large-scale commercial application. To resolve some of the most pressing challenges preventing widespread implementation of IGCC technology, the government should support research and development efforts focusing on advanced gasification technologies to improve the efficiency and reduce capital costs simultaneously. IGCC technology already offers significant reductions in emissions of the major criteria air pollutants (NOx,SO2, particulate matter and CO) as compared to PC plants. It is already being considered as one of the most promising technologies in reducing the environmental consequences of generating electricity from coal.

Keywords: IGCC, Gasification, HRSG, Emission, Coal Gasification, Environment Friendly.

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Authors: G. V Krishna Reddy, N. Chikkanna, H. S Monohar, B. Umamaheswar Goud

Paper Title: Experimental Evaluation of Thermal Transport Characteristics of MMC's for heat Sink Material for Electronics Cooling

Abstract: In this work, effort has been made in the evaluation and enhancement of thermal transport characteristics of metal matrix composites. The Thermal management systems are important in today's faster growing industrial needs which are demanding the high end processors with highest speed and reliability of performance. However, this work focuses on the development of new material for heat sink. Generally, the heat sink is attached to the CPU by the manufacturer mechanically. There is possibility of high stress inducement in the CPU due to mechanical fastening and the heat transfer is not effective as there will be a 100% surface to surface contact. Also there is a high possibility of shorting of electronic circuitry of the CPU due to the high conductivity of the heat sink material. In order to overcome these problems, effort is made to resolve the problem by developing the metal matrix composites to match with the required properties of the heat source. In this work, initially, the importance and motivation behind the evaluation of the thermal characteristics for the MMC's. The development of new MMC's was detailed along with the different compositions of the MMCs. For this, initially, baseline materials were explained in detail along their thermal properties. Six MMC's have been proposed with varying compositions of aluminum and silicon carbide. Aluminum was varied in percentage composition from 25% to 65% and Sic was varied between 35% to 75%. The MMC's were evaluated for the properties lie thermal conductivity, specific heat, thermal diffusivity, CTE. Also, the variation of these properties with respect to temperature is evaluated. Finally recommendations are given for the MMC's based on the required property criteria of the heat source material.

2.

Keywords: Aluminum, Silicon carbide, Heat sink, Thermal conductivity, CTE, Specific heat.

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3.

Authors:	**Shabina Dhuria, Sonal Chawla**
Paper Title:	**Ontologies for Personalized E-Learning in the Semantic Web**

Abstract: Semantic web, next generation intelligent web, is one of the emerging research areas in intelligent web technology and has high potential for research. It can be considered as a content-aware intelligent web. SW technologies will influence the next generation of e-learning systems and applications. To structure the learning material, ontology is a key constituent in the structural design of the Semantic Web. Ontology is a formal specification of a particular domain that describes set of objects, properties that objects can have and various ways how these objects are related to each other.This paper has threefold objective. Firstly, it would help to understand Semantic Web currently exists as a vision, is a promising technology for realizing eLearning requirements. Ontology is primary and most important part of semantic web, improves the learning process as it focuses on relationship rather than information. Secondly, it throws light on classification of ontologies in computer science and how ontoligies in higher education can enhance the search of the learning material. Thirdly, it focuses on analysis of various ontology tools helpful in knowledge retrieval, knowledge storage, and knowledge sharing.

Keywords: E-Learning, Ontology, Ontology Tools, Semantic Web.

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4. — Pages **19-24**

Authors: **Chitra P, Saranya S, Manikandan T**

Paper Title: **Numerical Analysis of In-Plane Shear Strength on GFRP Composites under Adverse Thermal Ageing Condition**

Abstract: Glass reinforced polymers are used in a wide variety of engineering applications and this occurrence continues. The exposure of composite structures to adverse environmental conditions during their service life period leads to degradation, which affects its material properties. The main objective of this paper is to determine the in-plane shear properties of uni-directional Glass/epoxy laminates when subjected to the various thermal conditions (Ambient, 253k, 343k). The in-plane shear properties of GFRP were studied by Iosipescu model, where the models were designed in various orientations (0 The Iosipescu model has been designed as per the specifications prescribed in the ASTM 5379. The design and analysis of a three dimensional finite element model were carried out using ABAQUS/CAE. Crack initiation and propagation has been achieved by eXtended Finite Element Method (XFEM). In plane shear failures for [0], [90] and [0/90] were observed. Graphs have been plotted for in-plane shear stresses and shear strains to interpret the behavior of material under various thermal ageing conditions. Among all the other material orientations, cross ply laminates at room temperature possess higher in-plane shear strength, exhibits significant variations on both thermal ageing conditions than 0° and 90° orientations. The failure mechanism of thermally exposed FEA model has done by the C3D8R stress distribution model.

Keywords: In-plane shear, Iosipescu shear test, Thermal Ageing, GFRP, ABACUS/CAE, (0°,90°,0/90°) orientation.

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5. — Pages **25-28**

Authors: **To-Po Wang, Jai-Yang Syu**

Paper Title: **A New 0.4-V 27-dB 3.1-10.6-GHz UWB Low- Noise Amplifier with Dual-Band B and Pass Filter**

Abstract: A low-voltage high-gain ultra-wideband (UWB) low-noise amplifier (LNA) with dual-band tunable bandpass filter for interference rejection is proposed in this paper. There are two sections of the proposed multi-band tunable bandpass filter. The first one is designed for 2.4-GHz interference rejection, and the other one is for 5.2-GHz interference blocking. In addition, high-Q active inductors are adopted in each bandpass filter section for improving the interferences rejection. According to the proposed circuit topology, the UWB LNA has been designed in 0.18-□ m CMOS process. Simulated results confirm the UWB LNA combining the proposed dual-band tunable bandpass filter can effectively achieve high gain of 27 dB, low noise figure of 2.8 dB, low LNA supply voltage of 0.4 V, and total dc power consumption including multi-band tunable bandpass filter of 16.4 mW. In addition, the simulated interference rejections at 2.4 GHz and 5.2 GHz are 46 dB and 29 dB, respectively.

Keywords: Interference rejection, low-noise amplifier (LNA), noise figure, notch filter.

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