Record 1 of 68

By: Bablani, A (Bablani, Annushree); Edla, DR (Edla, Damodar Reddy); Tripathi, D (Tripathi, Diwakar); Dodia, S (Dodia, Shubham); Chintala, S (Chintala, Sridhar)

Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
Bablani, Annushree		0000-0003-3246-1402

Title: A Synergistic Concealed Information Test With Novel Approach for EEG Channel Selection and SVM Parameter Optimization

Abstract: In the era of data, it is a challenging task to classify continuous data such as electroencephalographic data. The electroencephalographic signal maps several thoughts going in an individual's brain by connecting a device to the human brain. In this paper, we have proposed a deceit identification system using a test called "concealed information test." The electroencephalographic data have been recorded when the concealed information test is performed for experimental analysis. To enhance the performance of the deceit identification system, the optimization of support vector machine (SVM) parameters and the selection of the EEG channels are performed. This paper implements a binary version of the BAT algorithm (binary BAT algorithm) and the conventional BAT algorithm on the electroencephalography (EEG) data. A novel cost function is also proposed, which utilizes the results of continuous BAT and binary BAT to enhance the system performance. In this synergistic approach, BAT is used for the SVM parameters optimization, and the binary BAT algorithm is applied for the EEG channel selection. The performance of the system is improved, and it is inferred that the channels placed at the occipital lobe of the brain consist of the artifacts. After removing the channels placed on the occipital lobe, i.e., O1, Oz, and O2, and using the optimized SVM parameters, the system's average accuracy increases from 94.11% to 96.8%.

Times Cited in BIOSIS Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Times Cited in Chinese Science Citation Database: 0

Times Cited in Russian Science Citation Index: 0

Total Times Cited: 0

Usage Count (Last 180 days): 11

Usage Count (Since 2013): 11

Record 2 of 68

By: Arun, I (Arun, Ilangovan); Gangadhar, B (Gangadhar, B.); Yuvaraj, C (Yuvaraj, C.); Kousalya, C (Kousalya, C.)

Title: Electrical discharge metal matrix composite coating on duplex stainless steel and its wear behavior under different environmental conditions

Abstract: The current study evaluates the effect of inclusion of nickel with a varying concentration that influences the tribological behaviour of the electrical discharge coating over the duplex stainless steel. Aflaw free coating was obtained while increasing the nickel weight percentage with an improved hardness of 915HV0.5 to 1100 HV0.5 that trice the time of the substrate. Wear test is carried under a higher temperature of 600 degrees C in Pin-On-Disc tribometer with the varied environmental condition pin and chamber shows that increase in the concentration of nickel reduces the formation of oxides, surface roughness, and thermal cracks. In addition, electrode copper with carbon from the dielectric deposited within the coating owns strain rate, this significantly accommodates the hard carbides debris as third body wear between the contacts. Analyzing of surface morphology was detailed through 3D optical profilometer together with microstructural transformation, wear mechanism and coating thickness by Scanning Electron Microscope followed through Energy Dispersive Spectroscopy for elemental analysis and hardness through Vickers Microhardness. Moreover, the pyrolysis carbon with nickel accommodates the hard carbides with an inferior frictional coefficient and specific wear rate.

Times Cited in Chinese Science Citation Database: 0

Times Cited in BIOSIS Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Russian Science Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

Usage Count (Last 180 days): 0

Usage Count (Since 2013): 0

Record 3 of 68

By: Singh, MM (Singh, M. Muralidhar); Kumar, H (Kumar, Harinandan); Nagesha, KV (Nagesha, K. V.); Sivaiah, P (Sivaiah, P.); Kumar, GH (Kumar, G. Hemath); Ajay, KM (Ajay, K. M.); Vijaya, G (Vijaya, G.)

Title: Evaluation of Multilayer Thin Film Coatings for Solar Thermal Applications

Abstract: The multilayer thin film coatings are one of the proven technologies for improvement in solar thermal and optical applications. In current solar thermal and optical systems, multilayer thin film coatings find application in many functions such as photovoltaics, heat exchangers, filters, sensor technologies, laser windows, mirrors, reflectors and optics for digital projections. The solar absorptance and thermal emittance of the multilayer thin film coatings are one of the leading factors for its applicability in said areas. The processing conditions, morphology and surface finish influence the solar absorptance and thermal emittance behavior of multilayer thin film coating. Therefore, emphasis has given in this paper to deposit multilayer thin film coatings with an increased solar absorptance and decreased thermal emittance to improve its applicability in solar thermal applications. Multilayer thin film coatings (Al_2O_3/Ni/W-Al_2O_3/W) were deposited using DC/RF magnetron sputtering on the stainless steel substrate to improve its applicability in solar thermal receiver tube for power generation. The performance of this multilayer thin film was investigated by measuring the absorptance and emittance using 410 Solar and ET 100 in the solar spectrum region at a variable incident angle from 20 degrees to 60 degrees. The effect of optical properties, microstructure and morphology of the multilayer thin film coatings was also investigated. The maximum absorptance 0.92 and minimum emittance <0.1 were observed in deposited multilayer thin film coating with the combination of Tungsten, Al_2O_3 and Nickel, respectively. The observed values indicate the practical applicability of the multilayer coatings in medium-to-high-temperature range of solar thermal receiver tubes.

By: Arun, I (Arun, Ilangovan); Gangadhar, B (Gangadhar, B.); Yuvaraj, C (Yuvaraj, C.); Kousalya, C (Kousalya, C.)

Title: Electrical discharge metal matrix composite coating on duplex stainless steel and its wear behavior under different environmental conditions

Abstract: The current study evaluates the effect of inclusion of nickel with a varying concentration that influences the tribological behaviour of the electrical discharge coating over the duplex stainless steel. A flaw free coating was obtained while increasing the nickel weight percentage with an improved hardness of 915HV0.5 to 1100 HV0.5 that trice the time of the substrate. Wear test is carried under a higher temperature of 600 degrees C in Pin-On-Disc tribometer with the varied environmental condition pin and chamber shows that increase in the concentration of nickel reduces the formation of oxides, surface roughness, and thermal cracks. In addition, electrode copper with carbon from the dielectric deposited within the coating owns strain rate, this significantly accommodates the hard carbides debris as third body wear between the contacts. Analyzing of surface morphology was detailed through 3D optical profilometer together with microstructural transformation, wear mechanism and coating thickness by Scanning Electron Microscope followed through Energy Dispersive Spectroscopy for elemental analysis and hardness through Vickers Microhardness. Moreover, the pyrolysis carbon with nickel accommodates the hard carbides with an inferior frictional coefficient and specific wear rate.

By: Shankernath, V (Shankernath, V); Naidu, KL (Naidu, Lakshun K.); Krishna, MG (Krishna, Ghanashyam M.); Padmanabhan, KA (Padmanabhan, K. A.)

Title: Optical properties of magnetron sputtered nanocrystalline gold nitride thin films

Abstract: The significance of this work is the direct synthesis of gold nitride films for surface plasmonic applications. Nanocrystalline gold nitride thin films were fabricated by reactive radio frequency (RF) magnetron sputtering on Phynox alloy substrates at room temperature and 250 degrees C for 1 and 2 h under a fixed power density of 0.3 W cm(-2). The deposition rate is 50 nm h(-1). X-ray diffraction (XRD) patterns reveal the formation of AuN_2 phase with an orthorhombic crystal structure of gold nitride and was further confirmed and supported by Selected Area Electron Diffraction (SAED) patterns and High-

Resolution Transmission Electron Microscopy (HR-TEM) images. Specular reflectance in the visible and near-infrared region is between 20 to 70%. Optical constants and dielectric functions of the films were obtained by employing the Drude-Lorentz model in the range of 1.37-4.1 eV. The real dielectric function crosses zero for values between 1.80-2.22 eV indicating that AuN2 films are suitable material for surface plasmonic applications. Field Emission Scanning Electron Microscopy (FE-SEM) images reveal the nano-porous microstructure of the films. Nanoindentation data show that films hardness values are in the range of 4-7 GPa, which are significantly higher compared with hardness values reported by others.

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Usage Count (Last 180 days): 5

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Record 6 of 68

By: Gotra, S (Gotra, Shailza); Varshney, G (Varshney, Gaurav); Yaduvanshi, RS (Yaduvanshi, Rajveer Singh); Pandey, VS (Pandey, Vinay Shankar)

Title: Dual-band circular polarisation generation technique with the miniaturisation of a rectangular dielectric resonator antenna

Source: IET MICROWAVES ANTENNAS & PROPAGATION

Volume: 13

Issue: 10

Pages: 1742-1748

DOI: 10.1049/iet-map.2019.0030

Published: AUG 14 2019

Abstract: A technique is proposed to obtain the dual-band circularly polarised (CP) response along with the miniaturisation of a singly fed rectangular dielectric resonator (DR) antenna. The miniaturised response is obtained by applying the metallic strips on the sidewalls of the DR. The specific format of the applied metallic strips excites the orthogonal degenerate modes. Thus, a dual-band CP response is obtained along with the miniaturisation of antenna. The proposed antenna is designed to obtain the small frequency ratio. The frequency ratio can also be tuned by changing the surface area of the applied metallic strips.

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Times Cited in BIOSIS Citation Index: 0

Times Cited in Russian Science Citation Index: 0

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Usage Count (Last 180 days): 0

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Accession Number: WOS:000478605200033

Record 7 of 68

By: Murthy, KVN (Murthy, K. V. Narasimha); Saravana, R (Saravana, R.); Kumar, KV (Kumar, K. Vijaya)

Title: Stochastic modelling of the monthly average maximum and minimum temperature patterns in India 1981-2015

Source: METEOROLOGY AND ATMOSPHERIC PHYSICS

Volume: 131

Issue: 4

Pages: 775-787

DOI: 10.1007/s00703-018-0606-5

Published: AUG 2019

Abstract: The paper investigates the stochastic modelling and forecasting of monthly average maximum and minimum temperature patterns through suitable seasonal auto regressive integrated moving average (SARIMA) model for the period 1981-2015 in India. The variations and distributions of monthly maximum and minimum temperatures are analyzed through Box plots and cumulative distribution functions. The time series plot indicates that the maximum temperature series contain sharp peaks in almost all the years, while it is not true for the minimum temperature series, so both the series are modelled separately. The possible SARIMA model has been chosen based on observing autocorrelation function (ACF), partial autocorrelation function (PACF), and inverse autocorrelation function (IACF) of the logarithmic transformed temperature series. The SARIMA $(1,0,0) \times (0,1,1)(12)$ model is selected for monthly average maximum and minimum temperature series based on minimum Bayesian information criteria. The model parameters are obtained using maximum-likelihood method with the help of standard error of residuals. The adequacy of the selected model is determined using correlation diagnostic checking through ACF, PACF, IACF, and p values of Ljung-Box test statistic of residuals and using normal diagnostic checking through the kernel and normal density curves of histogram and Q-Q plot. Finally, the forecasting of monthly maximum and minimum temperature patterns of India for the next 3years has been noticed with the help of selected model.

Times Cited in BIOSIS Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Chinese Science Citation Database: 0

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Usage Count (Last 180 days): 0

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Record 8 of 68

By: Varshney, G (Varshney, Gaurav); Gotra, S (Gotra, Shailza); Pandey, VS (Pandey, V. S.); Yaduvanshi, RS (Yaduvanshi, R. S.)
Title: Proximity-Coupled Graphene-Patch-Based Tunable Single-/Dual-Band Notch Filter for THz Applications

Abstract: A tunable single-/dual-band notch filter is proposed for THz applications. The filter geometry contains a proximity-coupled graphene patch. The filter structure operates with propagating- and nonpropagating-type transverse magnetic (TM) modes. Different higher-order TMmn (where m and n are integers) modes can be excited in the filter structure by changing the aspect ratio of the graphene patch, thus enabling the filter response to be tuned to obtain single- or dual-band notch characteristics. Appropriate selection of the physical parameters of the filter structure allows the desired response at different frequencies to be obtained. Furthermore, the response of the proposed band notch filter can be tuned over frequency by changing the chemical potential of the graphene.

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Times Cited in Web of Science Core Collection: 0
Times Cited in Chinese Science Citation Database: 0
Times Cited in Russian Science Citation Index: 0
Times Cited in SciELO Citation Index: 0
Total Times Cited: 0
Usage Count (Last 180 days): 4
Usage Count (Since 2013): 4

Record 9 of 68

By: Beemkumar, N (Beemkumar, Nagappan); Yuvarajan, D (Yuvarajan, Devarajan); Karthikeyan, A (Karthikeyan, Alagu); Ganesan, S (Ganesan, Subbiah)
Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
Nagappan, Dr BEEMKUMAR	G-3377-2015	0000-0003-3868-0382

Title: Comparative experimental study on parabolic trough collector integrated with thermal energy storage system by using different reflective materials

Abstract: The present study focuses on the performance analysis of parabolic trough collector (PTC) incorporated with single-tank thermal energy storage (TES) system with the use of two different reflective materials in PTC which includes glass and high-reflective stainless steel sheet. It consists of TES tank which contains 110L of Therminol-66 oil (heat transfer fluid). The experiments are conducted for the use of glass reflective material PTC and stainless steel reflective material PTC when both are integrated with TES system. The various performance parameters like useful energy gained by the PTC, energy collected in the PTC, PTC efficiency, heat loss coefficient and the stored amount of energy in TES tank are calculated to know the overall efficiency of the system during daytime. It has been concluded that the use of glass as the reflective material in PTC has better useful heat gain and high average PTC efficiency in comparison with stainless steel reflective material. However, the overall system performance is almost equal to both reflective materials. Silver-coated stainless steel reflective material may be preferred in PTC when it is coupled with single TES tank system, due to cost effectiveness and ease availability with a high-reflective power about 98.9%.

Times Cited in Russian Science Citation Index: 0
Times Cited in Web of Science Core Collection: 0
Times Cited in SciELO Citation Index: 0
Times Cited in Chinese Science Citation Database: 0
Times Cited in BIOSIS Citation Index: 0
Total Times Cited: 0
Usage Count (Last 180 days): 3
Usage Count (Since 2013): 3

Record 10 of 68

By: Vaish, R (Vaish, Rajat); Sarfaraz, M (Sarfaraz, Mohd); Ahmad, MK (Ahmad, Md Kalimuddin); Kazmi, KR (Kazmi, Kaleem Raza)
Title: Approximate solution of zero point problem involving H-accretive maps in Banach spaces and applications

Abstract: In this manuscript, we introduce two iterative methods for finding the common zeros of two H-accretive mappings in uniformly smooth and uniformly convex Banach spaces. The proposed iterative methods are based on Mann and Halpern iterative methods and viscosity approximation method.

Strong convergence results are established for iterative algorithms. Applications based on convex minimization problem, variational inequality problem and equilibrium problem are derived from the main result. Numerical implementation of the main results and application are demonstrated by some examples. Our results extend, generalize, and unify the previously known results given in literature.

By: Bablani, A (Bablani, Annushree); Edla, DR (Edla, Damodar Reddy); Tripathi, D (Tripathi, Diwakar); Kuppili, V (Kuppili, Venkatanareshbabu)

Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
Kuppili, Venkatanareshbabu	D-3567-2017	0000-0001-5059-2655
Bablani, Annushree		0000-0003-3246-1402

Title: An efficient Concealed Information Test: EEG feature extraction and ensemble classification for lie identification

Abstract: EEG-based lie detectors have become popular over polygraphs because it cannot be controlled by human intentions. Various studies have performed Guilty Knowledge Test or Concealed Information Test by creating a mock crime scenario to identify changes in brain potential. In this study, an individual's behavior during lying is analyzed and a new scenario is developed for Concealed Information Test. This work involves a mock crime scenario using an EEG acquisition device for 10 participants. Data acquisition has been performed by placing 16 electrodes on the subjects' scalp. For this experiment, the subject has to recognize faces of some known and unknown personalities among 10 images flashed. These images behave as stimulus for the subject which generate corresponding brain responses. Various feature extraction approaches such as statistical, time domain, frequency domain and time-frequency domain are applied to the 16- channel EEG data. For classifying a subject as guilty or innocent, five classifiers have been applied on subject-wise EEG data. Moreover, the classifiers' ranking is considered based on the performance of classifiers. An ensemble framework is developed by aggregating the results of the best three classifiers out of the tested five classifiers. The classifiers' results are aggregated using a weighted voting approach and have been compared with popular conventional approaches using various classification performance measures. Results present a comparative performance of different feature extraction approaches and classifiers using subject-wise single-trial EEG data. The wavelet approach performs better for EEG data of most of the subjects. A comparison between base classifiers and ensemble framework is provided with the ensemble approach outperforming over the base classifiers. Further proposed framework is compared with some existing approaches, and a highest accuracy of 92.4% has been achieved.

By: Hadjichristov, GB (Hadjichristov, Georgi B.); Ivanov, TE (Ivanov, Tzvetan E.); Marinov, YG (Marinov, Yordan G.); Koduru, HK (Koduru, Hari Krishna); Scaramuzza, N (Scaramuzza, Nicola)

Title: PEO-PVP-NaIO4 Ion-Conducting Polymer Electrolyte: Inspection for Ionic Space Charge Polarization and Charge Trapping

Abstract: Ion-conductive solid polymer electrolytes composed from blends of poly(ethylene oxide) (PEO) and poly(vinylpyrrolidone) (PVP), as complexed with the ionic compound sodium periodate (NaIO4), are inspected for the presence of electric charge trapping (CT) and ionic space charge polarization (SCP) under static electric field. Thin films (110 mu m-thick) of these materials are produced at a ratio of the polymers PEO:PVP = 70:30 wt%, the concentration of NaIO4 is 5, 7.5, or 10 wt%. The electrical current at room temperature, as well as the charging/discharging in the films are studied as depending on applied voltage and time. At a detectable level, no SCP and CT processes in PEO-PVP-NaIO4 are evidenced, in contrast to identical experiments by PEO film under the same experimental conditions. The largely reduced SCP and CT are of importance for electrochemical applications of the considered ion-conducting PEO-PVP-NaIO4 ion-polymer coupled system.

Record 13 of 68

By: Bhosale, A (Bhosale, Avadhoot); Zade, NP (Zade, Nikhil P.); Davis, R (Davis, Robin); Sarkar, P (Sarkar, Pradip)
Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
Sarkar, Pradip	G-9837-2014	0000-0003-1031-4479

Title: Experimental Investigation of Autoclaved Aerated Concrete Masonry

Abstract: The strength and stiffness characteristics of infill masonry wall significantly influence the behavior of reinforced concrete framed structures. Although such characteristics for conventional masonry infill walls, like clay and fly ash bricks, are well documented in the literature, experiments for the evaluation of similar properties for modern infill walls using autoclaved aerated concrete (AAC) blocks are limited. This paper reports the experimental results of an investigation of the structural properties of AAC block masonry required for mathematical modeling of AAC masonry-infilled framed structures. It also investigates some of the physical properties of AAC blocks that influence their structural properties and overall behavior.

Record 14 of 68

By: Mathew, A (Mathew, Aneesh); Sreekumar, S (Sreekumar, Sreenu); Khandelwal, S (Khandelwal, Sumit); Kumar, R (Kumar, Rajesh)

Title: Prediction of land surface temperatures for surface urban heat island assessment over Chandigarh city using support vector regression model

Abstract: Rapid urbanization is one of the primary reasons for changing the local climate, and there is a high impact on the surrounding areas. Chandigarh is one of the fastest developing cities in India showing rapidly urbanizing agglomeration. Due to the rapid urbanization, natural land surfaces are being replaced by the anthropogenic materials which negatively impacts the ecosystem resulting in urban heat island (UHI) effect. Land surface temperature (LST) is the primary and vital step for the analysis of UHI effect. The present study has been conducted to predict the LSTs for the assessment of UHI effect of the area surrounding Chandigarh city. Remote sensing data from Moderate-Resolution Imaging Spectroradiometer (MODIS) sensor and Advanced Spaceborne Thermal Emission and Reflection Radiometer Global Digital Elevation Model (ASTER GDEM) have been used for the prediction of LST. In the study, support vector regression (SVR) model has been developed from LST values of previous three years along with enhanced vegetation index (EVI), road density (RD) and elevation as input parameters to predict LST. The results of the SVR model have been validated using the data of the year 2014. A comparison of the model estimated LST and measured LST indicates that the range of mean absolute error (MAE) and mean absolute percentage error (MAPE) varies between 0.521 K and 0.525 K and 0.181-0.187%, respectively. Hence, SVR model can be used as a significant tool to predict LST for the assessment of heat island effect at any location. From the sensitivity analysis, it is observed that LST was ultimately the most sensitive to the RD compared to EVI and elevation. The SVR model has been compared with artificial neural networks (ANN) model to estimate the skill score factor of the SVR model (Forecasted) with reference to the ANN (Referred) model. Skill scores calculated for the periods show positive values which clearly depicts the efficacy of SVR model compared to ANN model for better LST prediction.

By: Sitharthan, R (Sitharthan, R.); Parthasarathy, T (Parthasarathy, T.); Rani, SS (Rani, S. Sheeba); Ramya, KC (Ramya, K. C.)
Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
RAMYA, K C	V-1410-2019	0000-0002-6765-2869

Title: An improved radial basis function neural network control strategy-based maximum power point tracking controller for wind power generation system

Abstract: This literature presents an improved maximum power point tracking (MPPT) controller based on radial basis function neural network (RBFNN) control strategy to extract optimal power for wind power generation system. The proposed RBFNN controller is trained online using gradient descent algorithm and its network learning rate modification is carried out by the modified particle swarm optimization algorithm. The proposed MPPT controller uses optimal torque control methodology to extract optimal power available in the wind by upholding the generated torque at an optimal level. The most promising aspects of the proposed controller are that it not only extracts maximum available power from wind, but it also rapidly responses to the change in wind speeds and maintains converter with negligible converter losses. To evaluate the performance of the proposed MPSO-RBFNN-based MPPT controller, an extensive simulation study and experimental analysis is performed. The attained results confirm the enhanced performance of the proposed MPPT controller.

By: Varshney, G (Varshney, Gaurav); Gotra, S (Gotra, Shailza); Kaur, J (Kaur, Jasleen); Pandey, VS (Pandey, V. S.); Yaduvanshi, RS (Yaduvanshi, R. S.)
Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
VARSHNEY, GAURAV	C-1858-2019	0000-0002-7001-9095

Title: Obtaining the circular polarization in a nanodielectric resonator antenna for photonics applications

Abstract: A technique is implemented for obtaining the circular polarization in a nano-dielectric resonator (DR) antenna. A cylindrical DR has been excited by a nanostrip feedline. The application of input Gaussian pulse at the corner of feedline splits the field components into two parts. These field components travel at the edges of the feedline with a quarter wavelength path difference between them. The coupling of these field components to DR provides the circularly polarized response. The antenna is designed for operating in the optical C-band. The proposed antenna provides the 10 dB impedance bandwidth of 11.58% (187-210 THz) and 3 dB axial ratio bandwidth of 5.72% (188.5-199.6 THz).

By: Koduru, HK (Koduru, H. K.); Marinov, YG (Marinov, Y. G.); Hadjichristov, GB (Hadjichristov, G. B.); Scaramuzza, N (Scaramuzza, N.)
Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number

KODURU, HARI KRISHNA		0000-0001-9158-810X

Title: Characterization of polymer/liquid crystal composite based electrolyte membranes for sodium ion battery applications

Source: SOLID STATE IONICS

Volume: 335

Pages: 86-96

DOI: 10.1016/j.ssi.2019.02.021

Published: JUL 2019

Abstract: A novel PEO/E8 liquid crystal based composite solid polymer electrolyte membranes complexed with NaIO4 salt were prepared by the solution casting technique. The composite-salt complexations were examined by X-ray diffraction (XRD), Fourier transform infrared (FTIR) spectroscopy, micro-Raman and X-ray photoelectron spectroscopy (XPS) studies. Differential scanning calorimetry (DSC) studies confirmed the decrease of percentage of crystalline portion in the matrix of electrolyte membranes upon that addition of NaIO4. The EIS studies evidenced for the increase of ionic conductivity of the electrolytes upon increase of NaIO4 concentration and in the present study, PEO/E8 electrolyte complexed with 10 wt% of NaIO4 demonstrated higher room temperature ionic conductivity of $1.05 \times 10(-7)$ S/cm.

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Times Cited in BIOSIS Citation Index: 0

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Accession Number: WOS:000466829700013

By: Mehar, K (Mehar, Kulmani); Panda, SK (Panda, Subrata Kumar)

Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
mehar, kulmani	J-9688-2017	0000-0001-5088-6813

Title: Theoretical deflection analysis of multi-walled carbon nanotube reinforced sandwich panel and experimental verification

Source: COMPOSITES PART B-ENGINEERING

Volume: 167

Pages: 317-328

DOI: 10.1016/j.compositesb.2018.12.058

Published: JUN 15 2019

Abstract: In this article, the influence of the multi-walled carbon nanotube reinforcement on the stiffness of sandwich curved panel is examined theoretically via deflection analysis and compared with own experimental data for the verification of accuracy. The nanotube-reinforced sandwich structural panel model is derived theoretically using the higher-order polynomial functions and displacement finite element steps adopted for the numerical solution purpose. The structural stiffness values are measured from the deflection resistance of the theoretical structural model by computing the structural equilibrium equation with the help of an own customized MATLAB code. Firstly, the numerical solution accuracy and the corresponding reliability of the present solutions are crosschecked through the element sensitivity including the comparison test. Further, the multi-walled carbon nanotube reinforced sandwich plate is fabricated for the required experimentation including the mechanical as well as the material characterization. Finally, the validity of theoretically predicted deflection data of sandwich structure demonstrated by comparing with the own experimental results. In addition, the effect of various design parameters on the stiffness behavior of the own fabricated sandwich construction is computed using the proposed theoretical model and discussed in detail.

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Times Cited in BIOSIS Citation Index: 0

Times Cited in Web of Science Core Collection: 2

Times Cited in Chinese Science Citation Database: 0

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Total Times Cited: 2

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Accession Number: WOS:000465060200028

By: Bera, R (Bera, Rajesh); Kundu, K (Kundu, Krishanu); Pathak, NN (Pathak, Narendra Nath)

Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
BERA, RAJESH	G-9203-2018	0000-0002-8482-022X

Title: Optimal Pattern Synthesis of Thinned and Non-Uniformly Excited Concentric Circular Array Antennas using Hybrid GSA-PSO Technique

Source: RADIOENGINEERING

Volume: 28

Issue: 2

Pages: 369-385

DOI: 10.13164/re.2019.0369

Published: JUN 2019

Abstract: Side Lobe Level (SLL) is considered as the most significant array pattern parameter as it helps in reducing surrounding noise and interference. As higher SLL value results in higher wastage of power in undesired direction, transmitters of wireless communication systems face serious problems. In this paper, the optimal design of seven different sets of concentric circular antenna arrays (CCAAs) of isotropic antenna has been represented with the goal of maximum reduction in SLL. Optimal pattern synthesis of the proposed arrays has been executed by optimizing the normalized current distributions of array elements having fixed inter-element spacing. In present work inter-ring spacing has been fixed at 0.5 lambda. In order to achieve low SLL in the radiation pattern of the optimized array antenna, many conventional optimization methods have been proposed in last few decades for handling complex, non-differentiable, discontinuous and highly nonlinear array factor. To deal with the problems of premature convergence (fall into local optima) feature of gravitational search algorithm (GSA) and particle swarm optimization (PSO) has been merged. In high-dimensional space, gravitational search algorithm hybridized with particle swarm optimization (GSA-PSO) is considered while preserving the fast converging property of them. Numerical results in the present text assume the pattern synthesis of thinned array and non-uniformly excited array for seven different sets of CCAA geometries. An exhaustive simulation results are presented and the radiation pattern performances are analyzed. As compared with conventional optimization techniques like GSA and PSO, hybrid GSA-PSO technique outperforms with the goal of maximum SLL suppression.

By: Amsaveni, A (Amsaveni, A.); Bharathi, M (Bharathi, M.); Swaminathan, JN (Swaminathan, J. N.)

Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
A, Amsaveni	P-6093-2015	0000-0002-9082-8658
narayanan, swaminathan	P-7542-2015	0000-0002-7520-4839

Title: Design and performance analysis of low SAR hexagonal slot antenna using cotton substrate

Abstract: In this article, a novel compact hexagonal slot antenna for wearable devices is proposed. The proposed antenna is designed using textile substrates such as Polyester, Jeans and Cotton. The design and simulation is performed using Ansys High Frequency Structural Simulator. The simulated prototype is fabricated and tested for verification using Vector Network analyser. Results reveal that the proposed prototype provides a return loss of about -34dB and bandwidth from 3.9 to 6.5GHz for cotton substrate. Human hand phantom has been modeled to measure Specific absorption rate using CST-MWS. The average SAR values for Polyester, Jeans and Cotton are 0.02036W/kg, 0.04839W/kg and 0.01035W/kg respectively.

By: Devarajan, Y (Devarajan, Yuvarajan); Munuswamy, DB (Munuswamy, Dinesh Babu); Mahalingam, A (Mahalingam, Arulprakashajothi)

Title: Investigation on behavior of diesel engine performance, emission, and combustion characteristics using nano-additive in neat biodiesel

Abstract: This work investigates the combustion, performance and emission characteristics of neat palm stearin biodiesel (PSBD) fuelled diesel engine with silver oxide as a additive in various mass fractions (5 and 10ppm) and various particle size (10 and 20nm) particles and the results compared with conventional diesel. Experiments were conducted in a natural aspirated, single-cylinder diesel engine at a constant speed and compression ratio of 1500rpm and 18:1 respectively. Silver oxide (AgO) nano particles were added with neat biodiesel using ultrasonicator. The experimental investigation on diesel engine reveals that the addition of silver oxide nano-additives to PSBD resulted in enhancement in ignition characteristics because of enhanced surface area to volume ratio. Further, the addition of AgO nano-additive to PSBD resulted in enhancement in brake thermal efficiency (BTE) with a reduction in brake specific fuel consumption (BSFC). The experimental results also show that the AgO nanoparticles at 20nm particle size and 10ppm concentartion promote an improved level of hydrocarbon (HC), carbon monoxide (CO), smoke emissions and nitrogen (NOx) emission than neat biodiesel. Further, The AgO nano-additive inclusion at different 10ppm significantly reduces the peak pressure and increases the net Heat Release rate values and its corresponding CA. An

inclusion of 20nm nano-additive at 10ppm concentartion in PSBD reduces the In Cylinder Pressure and increases the Net Heat Release Rate values by 2.2 and 4.7% respectively than PSBD.

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Times Cited in BIOSIS Citation Index: 3
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Usage Count (Last 180 days): 2
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ISSN: 0947-7411
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Accession Number: WOS:000469823000009

Record 22 of 68

By: Bhattacharya, A (Bhattacharya, Ankan); Roy, B (Roy, Bappadittya); Chowdhury, SK (Chowdhury, Santosh K.); Bhattacharjee, AK (Bhattacharjee, Anup K.)
Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
Bhattacharya, Ankan	S-1260-2018	0000-0003-2350-1687

Title: Computational and experimental analysis of a low-profile, isolation-enhanced, band-notch UWB-MIMO antenna

Abstract: This paper presents a low-profile, isolation-enhanced, multiple-input multiple-output (MIMO) antenna with a band-notch feature. The MIMO structure comprises two fractal-shaped slotted radiating elements along with a defected ground structure. Arlon AR600 is used as the substrate material. The frequency notch is obtained by etching a split-ring rectangular resonating structure into the surface of the radiating elements. An impedance bandwidth of 3.0-11.1GHz is obtained along with a band-notch feature centered at exactly 3.5GHz. The analysis of the frequency- and time-domain response of the proposed structure gives satisfactory results, and good agreement is observed between the simulated and measured data. The simple design and compactness along with the incorporated band-notch feature justify the applicability of the presented antenna in the ultra-wideband communication domain.

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Usage Count (Last 180 days): 6
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Accession Number: WOS:000467915400030

Record 23 of 68

By: Sundar, DS (Sundar, D. Shanmuga); Umamaheswari, C (Umamaheswari, C.); Sridarshini, T (Sridarshini, T.); Karthikeyan, M (Karthikeyan, Madurakavi); Sitharthan, R (Sitharthan, R.); Raja, AS (Raja, A. Sivanantha); Carrasco, MF (Flores Carrasco, Marcos)
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T, Sridarshini		0000-0001-9922-4378

Title: Compact four-port circulator based on 2D photonic crystals with a 90 degrees rotation of the light wave for photonic integrated circuits applications

Abstract: A four-port optical circulator based on two-dimensional square lattice photonic crystals is reported. It is simple besides the brief framework. The crystalline geometrical structure of the circulator makes 90 degrees non-reciprocal transmissions of electromagnetic waves with low insertion loss and high levels of isolation by the diligence of magneto-optic crystals. The structure is novel because it uses a resonant cavity with a simple design. Also, in comparison to prior models, the proposed four-port circulator utilizes a two-dimensional square lattice crystal structure with a cylindrical ferrite section of the pi/4 Faraday angle. The finite element method is used for this anisotropic medium to get the tensor elements in this simulation. The importance of the gyromagnetic properties of ferrite crystals for the non-reciprocal transmission is investigated. Furthermore, the corresponding S-parameters for this circulator are analyzed and reported. Due to the compact size and ease of fabrication, this device can be realized for applications such as splitting and isolation in photonic integrated circuits.

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By: Alex, KV (Alex, Kevin, V); Jayakrishnan, AR (Jayakrishnan, A. R.); Kumar, SA (Kumar, Ajeesh S.); Ibrahim, AS (Ibrahim, A. Sulthan); Kamakshi, K (Kamakshi, K.); Silva, JPB (Silva, J. P. B.); Sekhar, KC (Sekhar, K. C.); Gomes, MJM (Gomes, M. J. M.)

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Author	Web of Science ResearcherID	ORCID Number
Silva, Jose		0000-0002-3485-7032
, KOPPOLE CHANDRA SEKHAR	B-5089-2019	0000-0003-2755-9712

Title: Substrate temperature induced effect on microstructure, optical and photocatalytic activity of ultrasonic spray pyrolysis deposited MoO3 thin films

Source: MATERIALS RESEARCH EXPRESS

Volume: 6

Issue: 6

Article Number: 066421

DOI: 10.1088/2053-1591/ab0f7a

Published: JUN 2019

Abstract: In this work, the substrate temperature (T-s) effect on the microstructure, optical and photocatalytic activity of spray pyrolysis deposited transparent molybdenum trioxide (MoO3) thin films is studied. Microstructure analysis reveals the coexistence of hexagonal and orthorhombic phases when T-s <= 300 degrees C and the existence of the orthorhombic phase only when T-s >= 400 degrees C. The SEM analysis suggests that the films consist of rod and spherical shaped grains. The dimensions of rods and spheres are found to be sensitive to T-s and can be correlated to strain. The band gap is increased from 3.06 to 3.46 eV with T-s. Photoluminescence analysis reveals that the emission corresponds to defects increased with T-s. The photocatalytic activity of MoO3 films deposited at various T-s is evaluated by using 0.5 mM Rhodamin-B (Rh-B) dye aqueous solution as a template. The film deposited at 500 degrees C shows the maximum photodegradation efficiency due to its high structural sensitivity, surface selectivity and catalytic anisotropy. The variation in efficiency with T-s is discussed based on the band bending effect, crystallographic orientation, surface morphology, defects concentration and light absorption capacity. The effect of irradiation time on photodegradation efficiency is also investigated. The MoO3 film shows photodegradation efficiency of 91% after two hour illumination and makes it suitable for photocatalytic applications.

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2019

By: Devarajan, Y (Devarajan, Yuvarajan); Choubey, G (Choubey, Gautam); Mehar, K (Mehar, Kulmani)

Title: Ignition analysis on neat alcohols and biodiesel blends propelled research compression ignition engine

Source: ENERGY SOURCES PART A-RECOVERY UTILIZATION AND ENVIRONMENTAL EFFECTS

DOI: 10.1080/15567036.2019.1618998

Early Access Date: MAY

Abstract: In this present study, the emissions and performance characteristics of four-stroke, single-cylinder, water-cooled, diesel engine fueled with different blends of Rice bran biodiesel and octanol blends i.e. RBD100, RBD90O10 (10% Volume of octanol dispersed in RBD100) and RBD80O20 (20% Volume of octanol dispersed in RBD100) at 1800 rpm for compression ratio 17.5:1 were investigated. The transesterification process was used for biodiesel production with the presence of the alkaline catalyst (KOH) and methanol. The optimum biodiesel yield was found to be 88%. The fuel properties of the blends were found to be within the ASTM limits. Experimental results revealed that BTE increased and BSFC decreased with octanol addition to rice bran biodiesel. Furthermore, the diesel engine fueled with octanol and biodiesel blends reduced the NOx, Smoke, HC, CO emission due to the higher latent heat of vaporization and improved chemical properties.

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Accession Number: WOS:000469069600001

By: Choubey, G (Choubey, Gautam); Deuarajan, Y (Deuarajan, Yuvarajan); Huang, W (Huang, Wei); Mehar, K (Mehar, Kulmani); Tiwari, M (Tiwari, Manuendra); Pandey, KM (Pandey, K. M.)

Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
Pandey, K. M.	D-4492-2012	0000-0001-7885-0353
mehar, kulmani	J-9688-2017	0000-0001-5088-6813

Title: Recent advances in cavity-based scramjet engine- a brief review

Abstract: At present, the critical issue related to design of scramjet engine is to achieve efficient mixing between the air and fuel. Among the several fuel injection strategies, cavity flame holder is identified as a well-organized method for supporting the ignition zone. In this review, some mixing enhancement approaches based on well-known cavity based injection scheme proposed in latest research works, are summarized in detailed. The influence of cavity on the performance of scramjet combustor is recapitulated from three aspects, namely variation of shape/geometry of cavity flame holder; location of fuel/air injection scheme; and recent progresses in dual/double cavity. This review reveals that the cavity rear wall-expansion is an innovative kind of cavity flame holder which has a great impact on the efficiency of scramjet combustor whereas the presence of micro air jets have improved the flame holding mechanism of scramjet engine. Additionally, the performance of scramjet is significantly improved by dual cavity indicating that the dual cavity flame holder would be a feasible preference for the future growth of scramjet engine. (C) 2019 Hydrogen Energy Publications LLC. Published by Elsevier Ltd. All rights reserved.

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By: Sahoo, PR (Sahoo, Pradosh Ranjan); Goyal, JK (Goyal, Jitendra Kumar); Ghosh, S (Ghosh, Sandip); Naskar, AK (Naskar, Asim Kumar)

Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
Goyal, Jitendra Kumar	V-9751-2019	

Title: New results on restricted static output feedback H_{∞} infinity controller design with regional pole placement

Abstract: This study addresses the design of static output feedback (SOF) controller for continuous time linear systems. New sufficient conditions are derived for designing SOF controllers. The development involves suitable decomposition of Lyapunov matrices and deriving linear matrix inequality (LMI) criterion that ensures H_{∞} infinity performance. LMI criteria for pole placement in the LMI region are also derived. The proposed criteria can be used for restricted SOF controller design effectively. Several numerical examples are presented to demonstrate the effectiveness of the proposed results.

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By: Prithivirajan, R (Prithivirajan, R.); Balasundar, P (Balasundar, P.); Shyamkumar, R (Shyamkumar, R.); Al-Harbi, NS (Al-Harbi, Naiyf Sulthan); Kadaikunnan, S (Kadaikunnan, Shine); Ramkumar, T (Ramkumar, T.); Narayanasamy, P (Narayanasamy, P.)

Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
Rajaram, Shyam Kumar	K-7691-2012	0000-0003-2923-8277
P, Balasundar	U-7402-2017	0000-0002-3578-3733
P, Narayanasamy	Q-7876-2016	0000-0002-1436-8338

Title: Characterization of cellulosic fibers from Morus alba L. stem

Abstract: The chemical microstructural, physical, and thermal properties of the Morus alba L. stem fibers (MAFs) are described for the first time in this work. By analyzing the results of chemical composition, it was observed that the cellulose content of the stem of MAFs is an acceptable value when compared with other fibers and showed better results. Due to their lightweight (1316 kg/m(3)) and the presence of high cellulose content (58.65%) with very little amount of wax (0.56%), they provide good bonding properties. In addition, analyzing the results of X-ray diffraction and Fourier transform infrared spectroscopy, we observe a degree of crystallinity of 62.06%, which is closely associated with the presence of crystalline cellulose, while the other components are amorphous. The diameter of the extracted cellulosic fibers was in the range 6-20 mu m. Moreover, it was possible to identify the degradation step of each primary component of lignocellulosic fiber and to observe that it is thermally stable up to 216 degrees C. The characterization results show that the MAF is a better replacement material for synthetic fibers because of its significant physical, chemical, and thermal properties.

By: Mehar, K (Mehar, Kulmani); Panda, SK (Panda, Subrata Kumar); Devarajan, Y (Devarajan, Yuvarajan); Choubey, G (Choubey, Gautam)

Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
mehar, kulmani	J-9688-2017	0000-0001-5088-6813

Title: Numerical buckling analysis of graded CNT-reinforced composite sandwich shell structure under thermal loading

Abstract: The buckling load parameters of the graded nanotube sandwich structure reported in this article under the influence of uniform thermal loading. The corresponding properties of the graded nanotube sandwich evaluated via the extended rule of mixture including temperature dependent properties of each constituent. The nanotube structural model derived mathematically using a higher-order polynomial displacement to maintain the required shear stress continuity and thermal distortion via Green-Lagrange strain. Further, the variational technique is adopted to obtain the governing equilibrium equation of the sandwich structural panel and the subsequent algebraic form achieved using the isoparametric displacement finite element steps. The computational buckling load parameter predicted using the own MATLAB code with the help of the current mathematical model. The model accuracy and the consistency are established through simultaneous convergence and validity study with available published results. Finally, the detail applicability of the current higher-order model is highlighted through a series of numerical examples and corresponding inferences.

2019

By: Bhattacharya, A (Bhattacharya, Ankan); Roy, B (Roy, Bappadittya); Chowdhury, SK (Chowdhury, Santosh K.); Bhattacharjee, AK (Bhattacharjee, Anup K.)

Title: An Isolation Enhanced, Printed, Low-Profile UWB-MIMO Antenna with Unique Dual Band-Notching Features for WLAN and WiMAX

Abstract: Here, a low-profile, printed, ultra-wideband (UWB), multiple-input-multiple-output (MIMO) antenna with unique dual band-notching feature for selective elimination of the interferences from the existing WLAN and WiMAX bands has been investigated. The antenna proposed here consists of two fractal radiators and a defected ground structure. The designed antenna shows an ultra-wide frequency bandwidth of 8.6 GHz (2.0-10.6 GHz). A slot having the shape of the English Letter "U" has been finely etched from the surface of the fractal radiators in order to realize a frequency band-notch, centered at 3.5 GHz (WiMAX). A second band-notch, centered at 5.2 GHz (WLAN) has been obtained by adding horizontal stubs. The prevailing issue of mutual isolation between the adjacent radiating elements has been significantly enhanced by incorporating a vertical decoupling strip at the rear side of the proposed two-port

diversity MIMO antenna. The antenna proposed here is compact in shape, having a dimension of 26 x 35 mm(2). Simulated and measured results show a good match, justifying its applicability in the modern communication era.

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Usage Count (Last 180 days): 1
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By: Dash, D (Dash, D.); Pandey, CK (Pandey, C. K.); Chaudhury, S (Chaudhury, S.); Tripathy, SK (Tripathy, S. K.)
Title: Structure, stability, and electronic properties of thin TiO2 nanowires of different novel shapes: An abs-initio study
Source: SCIENTIA IRANICA
Volume: 26
Issue: 3
Pages: 1951-1961
DOI: 10.24200/sci.2019.50644.1800
Published: MAY-JUN 2019

Abstract: This paper investigates the structural stability and electronic properties of titanium dioxide (TiO2) nanowires of different novel shapes using first-principle-based density functional approach. Among linear, ladder, saw tooth, square, triangular, hexagonal, and octahedron shaped atomic configurations, the ladder shape is the most energetically stable. After computation of lattice parameters as well as various mechanical properties of nanowire TiO2, it was observed that the highest bulk modulus was related to triangular TiO2 nanowire, which showed the highest mechanical strength of structure, whereas hexagonal configuration had the lowest bulk modulus, showing the lowest mechanical strength of structure. Analysis of various electronic properties showed that different configurations of TiO2 nanowires could have different utilities as solid-state materials. (C) 2019 Sharif University of Technology. All rights reserved.

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Times Cited in BIOSIS Citation Index: 0
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2019

By: Mishra, M (Mishra, Madhusmita)
Title: LDPC Codes and Digital Forensics - A Perspective Approach
Source: IETE JOURNAL OF RESEARCH
DOI: 10.1080/03772063.2019.1604170
Early Access Date: MAY

Abstract: Forensic science (or forensics) is the quisling of sciences and technologies to enquire and demonstrate facts of interest in relation to criminal or civil law. Although forensics has greatly enhanced investigators' ability to unriddle crimes, limitations are still there to be audited in and out of the courtroom in order to avoid wrongful convictions. Definition and establishment of likelihood ratio (LR) is one of the Computational methods that can be applied in the forensic sciences to increase the efficiency and effectiveness of forensic casework. It can be quite logical to apply sum product algorithm used in the case of decoding of Low density Parity check code for calculating Log-likelihood ratio (LLR), which in turn will be more effective than LR calculation in case of more effective error analysis. This theoretical endeavor explores this effort.

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Times Cited in Russian Science Citation Index: 0
Times Cited in BIOSIS Citation Index: 0
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By: Reddy, NNK (Reddy, Nallabala Nanda Kumar); Godavarthi, S (Godavarthi, Srinivas); Kumar, KM (Kumar, Kesarla Mohan); Kummara, VK (Kummara, Venkata Krishnaiah); Vattikuti, SVP (Vattikuti, S. V. Prabhakar); Akkera, HS (Akkera, Harish Sharma); Bitla, Y (Bitla, Yugandhar); Jilani, SAK (Jilani, S. A. K.); Manjunath, V (Manjunath, V.)
Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
kummara, venkata krishnaiah	G-6680-2013	0000-0002-1392-6502
Godavarthi, Srinivas		0000-0002-8134-2058

Title: Evaluation of temperature dependent electrical transport parameters in Fe3O4/SiO2/n-Si metal-insulator-semiconductor (MIS) type Schottky barrier heterojunction in a wide temperature range

Abstract: In this manuscript, we reported the electrical characteristics and structural analysis of In/Fe3O4/SiO2/n-Si/In MIS-type SBD heterostructure comprehensively in the temperature range 10-300K using I-V, XRD, TEM and AFM measurements. Pulsed laser deposition in association with DC magnetron sputtering techniques has been utilized to fabricate the proposed In/Fe3O4/SiO2/n-Si/In heterojunction. The fabricated heterojunction revealed that the I-V curves are non-linear and asymmetric in nature. Using these I-V curves in the forward-bias region, SBH is calculated as 0.02eV at 10K and 0.74eV at 300K. On the other hand, the ideality factor (n) value was calculated as 7.55 at 10K and 1.37 at 300K. The series resistance (R-S) values were also evaluated using Chenug's method and the values were 1121 at 10K and 334 at 300K. The dependence of important diode parameters such as SBH, n' and R-S' on measurement temperature was effectively explained firstly on account of triple Gaussian distribution of barrier heights with the help of barrier inhomogeneities of the prepared heterojunction. The value of the Richardson's constant calculated for the fabricated In/Fe3O4/SiO2/n-Si/In heterojunction in the 110-300K temperature regime was calculated to be 115.26A/cm(2)K(2) and is approximately equal to the theoretical value of 120A/cm(2)K(2) for n-type Si. In addition, the higher value (greater than one) of ideality factor at all operating temperatures from 10-300K demonstrated that the probable current transport across the Fe3O4/SiO2/n-Si junction is not only due to the thermionic emission (TE) mechanism. Hence, to reveal the origin of current transport mechanism i.e., other than TE, we noticed that the governing current transport process through the fabricated hetrojunction is mainly due to the tunneling assisted Poole-Frenkel class of emission across the Fe3O4/SiO2/n-Si junction which is found to be temperature-dependent.

By: Mehar, K (Mehar, Kulmani); Panda, SK (Panda, Subrata Kumar)

Title: Multiscale modeling approach for thermal buckling analysis of nanocomposite curved structure

Abstract: The thermal buckling temperature values of the graded carbon nanotube reinforced composite shell structure is explored using higher-order mid-plane kinematics and multiscale constituent modeling under two different thermal fields. The critical values of buckling temperature including the effect of in-plane thermal loading are computed numerically by minimizing the final energy expression through a linear isoparametric finite element technique. The governing equation of the multiscale nanocomposite is derived via the variational principle including the geometrical distortion through Green-Lagrange strain. Additionally, the model includes different grading patterns of nanotube through the panel thickness to improve the structural strength. The reliability and accuracy of the developed finite element model are varified by comparison and convergence studies. Finally, the applicability of present developed model was highlight by enlighten several numerical examples for various type shell geometries and design parameters.

By: Devarajan, Y (Devarajan, Yuvarajan)

Title: Experimental evaluation of combustion, emission and performance of research diesel engine fuelled di-methyl- carbonate and biodiesel blends

Abstract: This study details an outcome of the Di-methyl-carbonate(DMC) as a cetane improver on neat Almond biodiesel (BD100) to evaluate the emission and performance engine characteristics. Four fuels namely diesel, biodiesel (Almond Methyl Ester), a blend of B100-10% and 20% by volume of DMC (BD9ODMC1Oand BD8ODMC20) are prepared and tested on a stationary research diesel engine. The experimental parameters for BD8ODMC20 showed a 1.6% increase in thermal efficiency thereby reducing 4.1% of fuel consumption than the neat biodiesel at peak conditions. Experimental outcomes revealed that 20% of DMC reduces 7.4% CO, 5.2% HC and 4.7% NOx and 3.6% smoke emissions of BD100. Further, The DMC inclusion at 10% volume significantly reduces the peak pressure and increases the net Heat Release rate values and its corresponding CA. An inclusion of 20% DMC in BD100 reduces the In-Cylinder Pressure and increases the Net Heat Release Rate values by 2.2% and 4.7% respectively than BD100. From this study, it is inferred that BD8ODMC20 blend could be utilized as a substitute fuel for CI engine.

Record 36 of 68
By: Arun, I (Arun, Ilangovan); Yuvaraj, C (Yuvaraj, C.); Selvarani, P (Selvarani, P.); Senthilkumaar, JS (Senthilkumaar, J. S.); Thamizhmanii, S (Thamizhmanii, S.); Muruganandam, P (Muruganandam, P.)
Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
Arun, Ilangovan	N-9695-2016	0000-0002-8141-2562

Title: Synthesis of electrical discharge metal matrix composite coating through compacted semi-sintered electrode and its tribological studies
Source: JOURNAL OF THE BRAZILIAN SOCIETY OF MECHANICAL SCIENCES AND ENGINEERING
Volume: 41
Issue: 5
Article Number: UNSP 213
DOI: 10.1007/s40430-019-1718-7
Published: MAY 2019
Abstract: Electric discharge coating is an alternative process for surface modification/alloying/coating requirements to improve mechanical and metallurgical properties of the materials. The high-pressure compacted electrode is made of the semi-sintered nickel and tungsten during the electric discharging process which influences the material migration towards substrate. In this proecess addtiton of pyrolysis carbon from dielectric togeather with the alloying elements and substrate material results in formation of metal matrix composite coating. It depended on the stabilization pressure of spark which increases the deposition rate of alloying materials and reduces the carbon, brittleness, cracks, voids, blowhole on the surface and made the layer to be desired metallurgical properties. Modified layer shows higher in hardness value of 1100 HV0.5 and reduction in specific wear to $0.082 \times 10^{(-5)} mm(3)/Nm$ compared with uncoated substrate material. Inclusion of the alloying material and reduction of the carbon percentage consequences in self-lubricant properties which alter the wear rate and coefficient of friction. Surfaces topography obtained during alloying, material migration and the mechanism have been characterized through scanning electron microscopy and energy-dispersive X-ray spectroscopy. The wear behaviour has been analysed by using pin-on-disc tribometer.

Record 37 of 68
By: Perumal, A (Perumal, A.); Azhagurajan, A (Azhagurajan, A.); Baskaran, S (Baskaran, S.); Prithivirajan, R (Prithivirajan, R.); Narayansamy, P (Narayansamy, P.)
Author Identifiers:

Author	Web of Science ResearcherID	ORCID Number
S, Baskaran	N-9686-2016	0000-0001-7728-3641
, Narayanasamy	Q-7876-2016	0000-0002-1436-8338

Title: Statistical evaluation and performance analysis of electrical discharge machining (EDM) characteristics of hard Ti-6Al-2Sn-4Zr-2Mo alloy
Source: MATERIALS RESEARCH EXPRESS
Volume: 6
Issue: 5
Article Number: 056552
DOI: 10.1088/2053-1591/ab06da
Published: MAY 2019
Abstract: Nowadays, electrical discharge machining process is successfully employed to machining hard titanium alloys compared to other non-

conventional machining processes. The generation high temperature is utilized to melt and vaporize the hard titanium alloy during electrical discharge machining. The process parameters are highly influenced on the machining performance and need to be studied for optimum results. In the present research, the hard Ti-6Al-2Sn-4Zr-2Mo alloy was machined by EDM process and machining characteristics such as material removal rate, tool wear rate and surface roughness were analyzed statistically to get the optimum performance. The experiments were carried out based on the Taguchi orthogonal array method. From the statistical analysis of experimental results, the most significant parameters were identified as peak current, pulse on time and voltage. In addition to that SEM analysis was used to characterize the machined surface. The results of SEM analysis indicated that craters, surface cracks, globules and recast layer present on the machined surface.

By: Hoque, S (Hoque, Shanidul); Shekhar, S (Shekhar, Shashank); Sen, D (Sen, Debarati); Arif, W (Arif, Wasim)

Title: Analysis of handoff delay for proactive spectrum handoff scheme with PRP M/G/1/K queuing system in cognitive radio networks

Abstract: Spectrum handoff has a negative impact on the performance of cognitive users (CUs) in terms of handoff delay in cognitive radio (CR) networks. In this study, a pre-emptive resume priority (PRP) M/G/1/K queuing network model is proposed with a finite number of allowable interruptions for proactive decision spectrum handoff scheme in order to minimise the cumulative handoff delay (CHD) and total service time (TST) for CUs. The CHD and TST for different proactive decision handoff schemes: non-switching spectrum handoff, switching spectrum handoff, and random spectrum handoff are modeled under the proposed PRP M/G/1/K queuing network model. Comprehensive results of CHD and TST are obtained to compare the performances of the proactive decision handoff schemes under the proposed PRP M/G/1/K queuing network model. This study also presents an analytical framework to examine the effect of primary users activity and buffer size on spectrum handoff delay performance with a finite number of allowable interruptions in a CR network. Thereafter, the optimal buffer size (K) is estimated for the proposed PRP M/G/1/K queuing network model, which gives performance similar to the infinite buffer size PRP M/G/1 queuing model with negligible (<1%) error.

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Title: Synthesis of g-C3N4/N-doped CeO2 composite for photocatalytic degradation of an herbicide

Abstract: In photocatalysis, surface engineered CeO2 could be vital due to oxygen vacancies arise from multiple valency, i.e. Ce3+ and Ce4+. This study reports photocatalytic properties of g-C3N4/CeO2 composite synthesized by a facile method in the presence of L-arginine. Physicochemical properties of g-C3N4/CeO2 material were analyzed through various characterization techniques such as XRD, UV-Vis, physisorption, etc., and correlated with its photocatalytic activity. Observed bandgap of the synthesized composite material was in the visible region, around 2.8 eV which is less than that of typical ceria, but higher than bandgap of exfoliated g-C3N4. On the further side, N doping into CeO2 was confirmed through XPS analysis. It is estimated that synthesis method aided for the N doping, which further played key role in lowering the bandgap of g-C3N4/CeO2 composite. Finally, Photocatalytic activity of g-C3N4/CeO2 composite was analyzed through degradation of an herbicide i.e. diuron, and the study revealed the good performance of the catalyst. (C) 2018 Brazilian Metallurgical, Materials and Mining Association. Published by Elsevier Editora Ltda.

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By: Devarajan, Y (Devarajan, Yuvarajan); Nagappan, B (Nagappan, Beemkumar); Subbiah, G (Subbiah, Ganesan)
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Title: A comprehensive study on emission and performance characteristics of a diesel engine fueled with nanoparticle-blended biodiesel
Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH
Volume: 26
Issue: 11
Pages: 10662-10672
DOI: 10.1007/s11356-019-04446-1
Published: APR 2019
Abstract: The present work is aimed to analyze the performance and emission characteristics of mahua biodiesel-fueled diesel engine with copper oxide nanoparticle at various particle sizes (10 and 20 nm) and the results compared with conventional diesel fuel (BD). Experiments were conducted in a four-stroke, single-cylinder, constant speed, and naturally aspirated research diesel engine with an eddy current dynamometer. Conventional transesterification process is carried out to convert the raw mahua oil into mahua oil biodiesel (BD100). Copper oxide (CuO) was chosen as a nanoparticle; the mass fraction of 100 ppm and the particle sizes of 10 and 20 nm were blended with mahua oil methyl ester using an ultrasonicator, and the physicochemical properties were measured. The physicochemical properties of BD100 and nanoparticle-included BD100 are at par with EN14214 limits. Brake-specific fuel consumption (BSFC) of BD100 is higher than that of diesel, and brake thermal efficiency (BTE) is lower than that of diesel (D100). The inclusion of 10-nm particle size of CuO nanoparticle in BD100 improves the BSFC and BTE by 1.3 and 0.7%, respectively, when compared with BD100. The CuO nanoparticle inclusion at 20-nm nanoparticle in biodiesel further improves the performance parameters than those at 10-nm nanoparticle. Further, the BD100 promotes a lower level of smoke emissions, carbon monoxide (CO), and hydrocarbon (HC) and with a prominent increase in oxides of nitrogen (NOx) emissions. The inclusion of 10-nm particle size of CuO nanoparticle in BD100 reduces the NOx, HC, CO, and smoke emission by 3.9, 5.6, 4.9, and 2.8%, respectively, at peak load condition when compared with BD100. The addition of CuO nanoparticle at 20-nm nanoparticle in biodiesel further reduces the NOx, HC, CO, and smoke emissions.
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Title: Design of flexible textile antenna using FR4, jeans cotton and teflon substrates
Source: MICROSYSTEM TECHNOLOGIES-MICRO-AND NANOSYSTEMS-INFORMATION STORAGE AND PROCESSING SYSTEMS
Volume: 25
Issue: 4
Pages: 1311-1320
DOI: 10.1007/s00542-018-4068-y
Published: APR 2019
Abstract: In modern technology, reduction in size and complexity of the antenna are the primary objective of recent research. This reduced size antenna is the boon in medical applications. This paper proposes monopole antenna which constitutes a simple structure and light-weight with a use of textile substrate. The prototype designed in this paper will be used for Body Centric Wireless Communications operating in 2.45 GHz Industrial, Scientific and Medical band. Return loss of - 10 dB and wide bandwidth against the conventional monopole antenna is achieved in the proposed system. Besides, a satisfactory gain characteristic has been obtained using wearable textile monopole antenna when it is compared to the conventional monopole antenna.

By: Reniwal, BS (Reniwal, Bhupendra Singh); Vijayvargiya, V (Vijayvargiya, Vikas); Singh, P (Singh, Pooran); Yadav, NK (Yadav, Nand Kishor); Vishvakarma, SK (Vishvakarma, Santosh Kumar); Dwivedi, D (Dwivedi, Devesh)

Title: An Auto-Calibrated Sense Amplifier with Offset Prediction Approach for Energy-Efficient SRAM

Abstract: In this paper, for the first time, a novel offset suppression technique is proposed to tackle the offset issue. The key idea is to improve bit error rate (BER) with an energy-efficient offset prediction-based sense amplifier (OPB-SA) for static random access memory (SRAM). The OPB-SA effectively compensates for the branch current mismatch due to threshold voltage (V-TH) offset in SA sensing devices. Extensive simulation results, referring to an industrial hardware-calibrated UMC 65-nm CMOS technology, show that OPB-SA achieves 27.2, 20 and 11.1% offset reduction over current latch SA (CLSA), SA with inherent offset cancellation (SAOC) and offset-compensated current SA (OCCSA), respectively, without sacrificing performance. The OPB-SA features significant offset suppression capabilities with 31.3, 12.2 and 7% tighter offset distribution compared to CLSA, SAOC and OCCSA, respectively. The energy efficiency is 0.26fJ/bit, thus improving 61.04, 84.16 and 87.12% over SAOC, OCCSA and body bias SA (BBSA), respectively. The OPB-SA requires 0.72x, 0.8x and 0.88x less bit-line swings than CLSA, SAOC and OCCSA for targeted 0% BER. Hence, overall SRAM macro with proposed scheme exhibits a superior dynamic power metric over the conventional designs with 0.66x, 0.74x, 0.98x and 0.81x lower bit-line power consumption than CLSA, SAOC, OCCSA and BBSA, respectively.

By: Jayakrishnan, AR (Jayakrishnan, A. R.); Alex, KV (Alex, Kevin, V); Thomas, A (Thomas, Athul); Silva, JPB (Silva, J. P. B.); Kamakshi, K (Kamakshi, K.); Dabra, N (Dabra, Navneet); Sekhar, KC (Sekhar, K. C.); Moreira, JA (Moreira, J. Agostinho); Gomes, MJM (Gomes, M. J. M.)

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Title: Composition-dependent xBa(Zr0.2Ti0.8)O-3-(1-x)(Ba0.7Ca0.3)TiO3 bulk ceramics for high energy storage applications

Abstract: This work reports the composition dependent microstructure, dielectric, ferroelectric and energy storage properties, and the phase transitions sequence of lead free xBa(Zr0.2Ti0.8)O-3-(1-x)(Ba0.7Ca0.3)TiO3 [xBZT-(1-x) BCT] ceramics, with x = 0.4, 0.5 and 0.6, prepared by solid state reaction method. The XRD and Raman scattering results confirm the coexistence of rhombohedral and tetragonal phases at room temperature (RT). The temperature dependence of Raman scattering spectra, dielectric permittivity and polarization points a first phase transition from ferroelectric rhombohedral phase to ferroelectric tetragonal phase at a temperature (TR-T) of 40 degrees C and a second phase transition from ferroelectric tetragonal phase - paraelectric pseudocubic phase at a temperature (TT-C) of 110 degrees C. The dielectric analysis suggests that the phase transition at TT-C is of diffusive type and the BZT-BCT ceramics are a relaxor type ferroelectric materials. The composition induced variation in the temperature dependence of dielectric losses was correlated with full width half maxima (FWHM) of A(1), E(LO) Raman mode. The saturation polarization (P-s) approximate to 8.3 mu C/cm(2) and coercive fields approximate to 2.9 kV/cm were found to be optimum at composition x = 0.6 and is attributed to grain size effect. It is also shown that BZT-BCT ceramics exhibit a fatigue free response up to 10(5) cycles. The effect of a.c. electric field amplitude and temperature on energy storage density and storage efficiency is also discussed. The presence of high TT-C (110 degrees C), a high dielectric constant (epsilon(r) approximate to 12,285) with low dielectric loss (0.03), good polarization (P-s approximate to 8.3 mu C/cm(2)) and large recoverable energy density (W = 121 mJ/cm(3)) with an energy storage efficiency (eta) of 70% at an electric field of 25 kV/cm in 0.6BZT-0.4BCT ceramics make them suitable candidates for energy storage capacitor applications.

2019

By: Prithivirajan, R (Prithivirajan, R.); Narayanasamy, P (Narayanasamy, P.); Al-Dhabi, NA (Al-Dhabi, Naif Abdullah); Balasundar, P (Balasundar, P.); Kumar, RS (Kumar, R. Shyam); Ponmurugan, K (Ponmurugan, K.); Ramkumar, T (Ramkumar, T.); Senthil, S (Senthil, S.)

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Title: Characterization of Musa paradisiaca L. Cellulosic Natural Fibers from Agro-discarded Blossom Petal Waste

Source: JOURNAL OF NATURAL FIBERS

DOI: 10.1080/15440478.2019.1588826

Early Access Date: MAR

Abstract: Musa paradisiaca L. blossom petal (MPBP) fibers are extracted from banana plant agro-based domestic waste. The properties of MPBP fibers were reported for the first time in this communication. X-ray diffraction analysis showed the crystallinity index and size of 56.71% and 16.38 nm, respectively. The thermogravimetric analysis indicates that the MPBP fibers are thermally stable up to 220 degrees C. Differential Scanning Calorimetry analysis gives two thermal degradation temperatures of 368.1 and 476.8 degrees C with kinetic activation energy of 62.43 kJ. Tensile strength, Young's modulus, and strain at failure were determined from the single fiber tensile test as 108 MPa, 1.05 GPa, and 11.15%, respectively.

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Title: Performance evaluation and emission characteristics of biodiesel-ignition enhancer blends propelled in a research diesel engine

Source: INTERNATIONAL JOURNAL OF GREEN ENERGY

Volume: 16

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Published: MAR 16 2019

Abstract: This study details the effect of the Di-Methyl-Ether(DME) as a cetane improver on neat cashew nut shell biodiesel (CBD100) to assess the emission and performance engine characteristics. Four fuels, namely, diesel, biodiesel (Cashew nut shell Methyl Ester), a blend of CBD100-10% and 20% by volume of DME (CBD90DME10and CBD80DME20) are prepared and tested on a stationary research diesel engine. The experimental parameters for CBD80DME20 showed a 1.6% increase in thermal efficiency thereby reducing 4.1% of fuel consumption than the neat biodiesel at peak conditions. Experimental result exposed that 20% of DME reduces 3.4% CO, 4.2% HC and 8.8% NOx and 8.4% smoke emissions of CBD100. Based on the outcome of this work, it is clear that CBD80DME20 shall be employed as a substitute fuel for diesel engine.

By: Samuel, RDJ (Samuel, Dinesh Jackson R.); Fnil, E (Fnil, E.); Manogaran, G (Manogaran, Gunasekaran); Vivekananda, GN (Vivekananda, G. N.); Thanjaivadivel, T (Thanjaivadivel, T.); Jeeva, S (Jeeva, S.); Ahilan, A (Ahilan, A.)

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Title: Real time violence detection framework for football stadium comprising of big data analysis and deep learning through bidirectional LSTM

Abstract: Football is the most popular sport in the world with four billion fans all over the world. Reportedly, the violence incidence rates are high during or after the matches. The violent or destructive behavior carried out by a person or player, who watches or plays the game in the stadium is known as football hooliganism. To prevent or control the violence, a real time violence detection system is exclusively needed to monitor the behavior of the crowd and players to take necessary action before the violence is about to happen. Even it is necessary for the system to find whether the attack is non-intentional or intentional in the game. In this paper, a real time violence detection system is proposed which processes the huge input streaming data and recognize the violence with human intelligence simulation. The input to the system is the enormous amount of real time video streams from different sources which is processed in Spark framework. In the Spark framework, the frames are separated and the features of individual frames are extracted by using HOG (Histogram of Oriented Gradients) function. Then the frames are labeled based on features as violence model, human part model and negative model, which are used to train the Bidirectional Long Short-Term Memory (BDLSTM) network for recognition of violence scenes. The bidirectional LSTM can access the information both in forward and reverse direction. Thus the output is generated in context to both past and future information. The network is trained with the violent interaction dataset (VID), containing 2314 videos with 1077 fight ones and 1237 no-fight ones. Moreover to make the model robust to violence detection, we have created a dataset with 410 video clips having non-violence scenes and 409 video clips having violence scenes, acquired from the football stadium. The performance of this model is validated and it proves the sturdiness of the system with an accuracy of 94.5 percentage in recognizing the violent action. (C) 2019 Elsevier B.V. All rights reserved.

By: Sivaiah, P (Sivaiah, Potta); Chakradhar, D (Chakradhar, D.)

Title: Performance improvement of cryogenic turning process during machining of 17-4 PH stainless steel using multi objective optimization techniques

Abstract: The present work address the problems like low productivity, high manufacturing cost and issues with conventional cooling techniques while machining of 17-4 precipitated hardened stainless steel (PH SS). To overcome these problems, optimization studies have been carried out under cryogenic cooling environment. Cryogenic machining (Liquid nitrogen) is an efficient eco friendly machining technique to satisfy the stringent environmental regulations. In the present work, Taguchi incorporated Gray relational analysis (TGRA) and Taguchi coupled Technique for Order Preference by Similarity to Ideal Solution (T-TOPSIS) optimization techniques have been applied for multi response optimization during rough turning of 17-4 PH SS respectively. The obtained result showed that improved performance was found at the TGRA determined optimum cutting conditions when compared T-TOPSIS technique determined optimum cutting conditions respectively. Furthermore, individual and interaction effect of process parameters on turning performance have been discussed using 3D surface plots. (C) 2018 Elsevier Ltd. All rights reserved.

By: Banthia, S (Banthia, Swastika); Sengupta, S (Sengupta, Srijan); Das, S (Das, Siddhartha); Das, K (Das, Karabi)

Title: Synthesis and characterization of novel Cu, Cu-SiC functionally graded coating by pulse reverse electrodeposition

Abstract: A Cu based functionally graded coating (FGC) has been deposited on an annealed Cu substrate by galvanostatic pulse reverse electrodeposition (PRED) route. The objective is to develop a hard surface with highly ductile and conducive interior. The cathodic current density (CCD) has been increased stepwise (from 50 to 200 mA/cm(2)) to synthesize Cu FGC on an annealed Cu substrate. It has three layers of Cu coating (20 mu m each) with a gradual reduction in crystallite size along the thickness. Two layers of Cu-SiC nanocomposite coating with an increment in the amount of incorporated SiC nanoparticles (from 2 to 7 vol%) are electrodeposited on Cu FGC. This is done by introducing bath agitation (350 and 450 rpm) during deposition at CCD of 200 mA/cm(2) , which has resulted in Cu, Cu-SiC FGC with five layers (12 mu m each). SiC nanoparticles are used to impart hardness to the coating through dispersion strengthening. The Cu, Cu-SiC FGC possesses higher hardness (similar to 3.8 GPa), lower residual compressive stress (similar to 291 MPa), and lower surface roughness (similar to 0.9 mu m) as compared to electrodeposited single layer Cu-SiC nanocomposite coating. With such properties Cu, Cu-SiC FGC on annealed Cu substrate can serve as a novel prospective electrical contact material.

By: Shankar, R (Shankar, Ravi); Kumar, I (Kumar, Indrajeet); Mishra, RK (Mishra, Ritesh Kumar)
Title: Outage Probability Analysis of MIMO-OSTBC Relaying Network Over Nakagami-m Fading Channel Conditions
Abstract: The objective of this study is to examine the outage probability (OP) performance of the multiple-input multiple-output (MIMO) cooperative communication system over Nakagami-m fading channel conditions. Source node transmits orthogonal space time block code (OSTBC) codeword to the relay & destination node and maximal ratio combiner (MRC) is used for the decoding purpose at the destination node. A mathematical framework is developed for the analysis of diversity order (DO) of the system. The closed form expression of OP is derived in terms of confluent hypergeometric function of two variables considering perfect channel state information (CSI). The Simulation results verified the accuracy of the derived analytical results. Furthermore, the results shown that the distances between the nodes significantly affect the OP performance.

By: Sivaiah, P (Sivaiah, P.); Chakradhar, D (Chakradhar, D.)
Title: Modeling and optimization of sustainable manufacturing process in machining of 17-4 PH stainless steel
Abstract: Currently, metal cutting industries are pushed for eco-friendly techniques to reach the severe environmental regulations. In this context, different environment sustainable machining techniques have been investigated along with the cutting conditions. The current work focuses on the culling of optimum cutting conditions in turning of 17-4 precipitation hardened stainless steel (PH SS) using Taguchi optimization method. In turning process, cutting speed (v), feed rate (f), depth of cut (d) and cooling environment (cryogenic, MQL and dry) were selected as controllable process parameters and surface roughness (R-a), tool flank wear (V-b) were considered as performance evaluation characteristics. Taguchi L-9 orthogonal array (OA) experimental design plan was consider for carrying out the experiments. From the conformation tests, it was found that the Taguchi analysis determined optimum process parameters significantly improved the turning performance during machining of 17-4 PH SS. From ANOVA results, it was seen that the turning performance in terms of R-a and V-b were greatly influenced by cutting speed. Furthermore, regression models were developed for predicting the R-a as well as V-b respectively. It was observed that cryogenic coolants overcome the health and environment problems which can lead to an absolute sustainable machining technique. It is recommended that metal cutting industries could used these optimum cutting conditions to reduced the material waste and increase the productivity while machining of 17-4 PH SS. (C) 2018 Elsevier Ltd. All rights reserved.

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Record 51 of 68
By: Bablani, A (Bablani, Annushree); Edla, DR (Edla, Damodar Reddy); Tripath, D (Tripath, Diwakar); Cheruku, R (Cheruku, Ramalingaswamy)
Title: Survey on Brain-Computer Interface: An Emerging Computational Intelligence Paradigm
Source: ACM COMPUTING SURVEYS
Volume: 52
Issue: 1
Article Number: 20
DOI: 10.1145/3297713
Published: FEB 2019

Abstract: A brain-computer interface (BCI) provides a way to develop interaction between a brain and a computer. The communication is developed as a result of neural responses generated in the brain because of motor movements or cognitive activities. The means of communication here includes muscular and non-muscular actions. These actions generate brain activities or brain waves that are directed to a hardware device to perform a specific task. BCI initially was developed as the communication device for patients suffering from neuromuscular disorders. Owing to recent advancements in BCI devices-such as passive electrodes, wireless headsets, adaptive software, and decreased costs-it is also being used for developing communication between the general public. The BCI device records brain responses using various invasive and non-invasive acquisition techniques such as electrocorticography (ECoG), electroencephalography (EEG), magnetoencephalography (MEG), and magnetic resonance imaging (MRI). In this article, a survey on these techniques has been provided. The brain response needs to be translated using machine learning and pattern recognition methods to control any application. A brief review of various existing feature extraction techniques and classification algorithms applied on data recorded from the brain has been included in this article. A significant comparative analysis of popular existing BCI techniques is presented and possible future directives are provided.

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Record 52 of 68
By: Chakraborty, U (Chakraborty, Ujjal); Biswas, AK (Biswas, Ashim K.); Maity, S (Maity, Sandip); Roy, B (Roy, Bappadittya); Roy, S (Roy, Sourav)
Title: Dielectric resonator array antenna for triple band WLAN applications with enhanced gain
Source: INTERNATIONAL JOURNAL OF RF AND MICROWAVE COMPUTER-AIDED ENGINEERING
Volume: 29
Issue: 2
Article Number: e21529
DOI: 10.1002/mmce.21529
Published: FEB 2019

Abstract: An H-shaped dielectric resonator array antenna is presented for wideband applications. The proposed antenna is excited by slot feed mechanism and investigated experimentally. The antenna covers the frequency ranges from 1.41 to 2.59GHz, and 4.73 to 6.06GHz with the corresponding impedance bandwidth of 59% and 24.65%, respectively. The simulation results fulfill the bandwidth requirements of IEEE 802.11a/b/g (2.4-2.484GHz/5.15-5.35GHz/5.725-5.825GHz) for Wireless local area network (WLAN) applications. The proposed antenna has simple structure, easy to fabricate and its measured radiation pattern shows a reliable performance in the desired operating bands.

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Record 53 of 68
By: Sivaiah, P (Sivaiah, P.); Chakradhar, D (Chakradhar, D.)
Title: The Effectiveness of a Novel Cryogenic Cooling Approach on Turning Performance Characteristics During Machining of 17-4 PH Stainless Steel Material
Source: SILICON
Volume: 11
Issue: 1
Pages: 25-38
DOI: 10.1007/s12633-018-9875-3
Published: FEB 2019

Abstract: In the present work, a tool holder design has been modified and fabricated, which act as a jet stream tool holder for supplying the cryogenic coolant (liquid nitrogen) to both rake and flank faces of cutting tool simultaneously in a novel way. The present work investigated the effect of cryogenic

coolant and turning process parameters on cutting temperature (T), tool flank wear (V-b), material removal rate (MRR) and surface integrity (surface roughness (R-a), surface topography (ST) and microhardness (H)) when it is supplied through the modified tool holder (Mode-I) while machining of 17-4 precipitated hardened stainless steel (PH SS) material and results were compared with the cryogenic coolant supplied at the machining zone with one external nozzle (Mode-II) respectively. Experimental results revealed that Mode-I (proposed cooling approach) significantly reduced the T and V-b wear to a maximum of 61% and 29% respectively when compared to cryogenic cooling with Mode-II approach. It was also found that cryogenic cooling with Mode-I approach affected the surface and subsurface characteristics positively over the cryogenic cooling with the Mode-II approach, which leads to substantial improvement in the final product performance respectively.

Record 54 of 68

By: Reddy, NNK (Reddy, N. Nanda Kumar); Akkera, HS (Akkera, Harish Sharma); Sekhar, MC (Sekhar, M. Chandra); Uthanna, S (Uthanna, S.)

Title: Influence of Ta2O5 Interfacial Oxide Layer Thickness on Electronic Parameters of Al/Ta2O5/p-Si/Al Heterostructure

Abstract: We describe the impact of Ta2O5 interfacial oxide layer thickness (ranging from 100-350 nm) on electrical and structural properties of Al/Ta2O5/p-Si/Al Metal-Insulator-Semiconductor (MIS) Schottky barrier diodes using RF magnetron sputtering. We studied the Schottky barrier device parameters such as ideality factor, barrier height and series resistance and are evaluated from current-voltage (I-V) measurements. The barrier height and ideality factor values are significantly varying with Ta2O5 oxide layer thickness and found to be 0.58 eV, 2.35, 0.71 eV, 2.10 and 0.78 eV, 1.87 for 20, 40 and 60 nm, respectively. It was noticed that the calculated barrier height and ideality values for this prepared Al/Ta2O5/p-Si/Al MIS Schottky barrier diode were greatly improved than those conventional metal-semiconductor (MS) Schottky diodes. The XRD studies revealed that the 100-nm thickness film exhibited poor crystallinity whereas 200 and 350 nm thickness films showed improved crystallinity with orthorhombic phase of -Ta2O5. The presence of this orthorhombic phase of -Ta2O5 is confirmed with FTIR studies. To explore the structural transformations in Ta2O5 films with varying thicknesses, Raman spectroscopy was utilized. In addition, the improvement in Schottky diode parameters was correlated with the enhanced crystallinity noticed in XRD studies.

Record 55 of 68

By: Suresh, S (Suresh, S.); Gowd, GH (Gowd, G. Harinath); Kumar, MLSD (Kumar, M. L. S. Deva)

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Title: Experimental investigation on mechanical properties of Al 7075/Al2O3/Mg NMMC's by stir casting method

Abstract: There is an increasing demand for light-weight, affordable and rapidly processed products as a result of their significant level of superiority these days. In the present research, the effect of mechanical stir casting on 7075 based lightweight aluminium alloy established together with nano-Al2O3 with average particle size (20-30) nanometre and wt.% of (1.0, 2.0,3.0, and 4.0) has been studied. Several scientists exposed that non-consistent distribution of nanoparticles possessing high porosity in the matrix. Electric stir casting could protect against the difficulties encountered with mechanical stir casting. By infusing Al2O3 particulates right into aluminium alloy the aluminium 7075/1% Wt. Al2O3 is giving area to nanocomposite. By including 1%, micro magnesium powder improved the wettability of the reinforcement. Optical microscope, SEM, studies carried out for the evaluation of composites. SEM micrographs reported that the nanoparticles were consistently distributed throughout the matrix and the active grain microstructure studies were preformed. The hardness, tensile strength, and impact results of Al7075/1% Wt. Al2O3 nanocomposites have been improved as compared with the Al7075 base alloy.

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Title: Experimental investigation of tool wear in cryogenically treated insert during end milling of hard Ti alloy

Abstract: The present study aims to investigate the tool wear mechanism of TiAlN-/NbN-coated tungsten carbide insert during end milling of hard Ti alloy under cryogenic treatment at 24h and 48h. The output responses are examined by looking at the flank wear, tool wear mechanism, elemental composition analysis, cutting force and vibration acceleration signal. A 12-23% and 4-11% reduction in the flank wear was noted at 48-h and 24-h cryogenically treated inserts (CTI) when compared with untreated insert. The reduction in the cutting force and vibration was also observed in the CTI when compared with untreated insert. The results showed better machinability and enhanced tool life for CTI, which is better than untreated insert under the same set of working conditions.

By: Kumar, P (Kumar, Prashanth); Bhowmick, B (Bhowmick, Brinda)
Title: Comparative Analysis of Hetero Gate Dielectric Hetero Structure Tunnel FET and Schottky Barrier FET with n plus Pocket Doping for Suppression of Ambipolar Conduction and Improved RF/Linearity

Abstract: In this paper, the comparative study of hetero gate dielectric hetero junction tunnel FET and Schottky barrier FET with n+ pocket doping at the source-channel junction have been investigated. Here n+ pocket doping is used to enhance the I-on current and to achieve high I-on/I-off ratio. The high-k at source and low-k near drain junction are encompassed to increase the current drivability of device and to reduce ambipolar conduction. Moreover, these devices also show better radio frequency performance, linearity parameters for different n+ pocket length, current-voltage characteristics, and high-frequency figure of merit (FOM) concerning the transconductance (gm), capacitances, transconductance generation factor (TGF), transconductance frequency product (TFP), and cut-off frequency (f(T)). Furthermore, the linearity FOMs such as higher order transconductance (gm3), VIP2, VIP3 and 1-dB compression point are examined using Sentaurus TCAD device simulator. These results depict that the optimizing of the appropriate n+ pocket doping length can be one of the potential measures in the proposed devices for low-power and high frequency applications.

By: Poornaprakash, B (Poornaprakash, B.); Chalapathi, U (Chalapathi, U.); Vattikuti, SVP (Vattikuti, S. V. Prabhakar); Sekhar, MC (Sekhar, M. Chandra); Reddy, BP (Reddy, B. Purusottam); Poojitha, PT (Poojitha, P. T.); Reddy, MSP (Reddy, M. Siva Pratap); Suh, Y (Suh, Youngsuk); Park, SH (Park, Si-Hyun)

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bpr, nani	U-9949-2019	

Title: Enhanced fluorescence efficiency and photocatalytic activity of ZnS quantum dots through Ga doping

Abstract: Zinc Sulfide (ZnS) quantum dots (QDs) with enhanced fluorescence efficiency and photocatalytic activity have been attained through Ga doping for the first time. Ga-doped ZnS QDs were synthesized via a solvothermal method using Polyethylene glycol (PEG) as a stabilizer. Transmission electron microscopy studies disclosed that the obtained QDs were slightly polydispersed with an average size of 5.5-3.8 nm. The results of X-ray diffraction and Raman and X-ray photoelectron spectroscopy stipulated that the Ga ions were successfully incorporated into the ZnS crystal lattice without amending their internal structure. A blue shift was noticed in the ZnS QDs when doped with Ga. The photoluminescence spectra of all the QDs displayed the same blue emission and enhanced fluorescence efficiency with increase in Ga doping content. The photocatalytic degradation of the phenol red dye under UV-light illumination was enhanced with increasing Ga doping concentration. Thus, the Ga-doped ZnS QDs are potential and favorable candidates for both photoluminescent and photocatalytic device applications.

By: Vinod, A (Vinod, Adla); Kumar, P (Kumar, Prashanth); Bhowmick, B (Bhowmick, Brinda)

Title: Impact of ferroelectric on the electrical characteristics of silicon-germanium based heterojunction Schottky barrier FET

Abstract: This work investigates the impact of ferroelectric gate oxide on high-k gate dielectric with low band gap Silicon Germanium ferroelectric Schottky barrier FET (SiGe Fe-SBFET), has been qualitatively simulated. The present research focuses on major improvement over the conventional device in terms of drain current and reduced subthreshold swing and analog performances. The proposed device has been analyzed in terms of numerous device electrostatic parameters such as electric field and energy band diagram using a ferroelectric material. A novel approach of SiGe-Fe-SBFET provides an effective technique helps to increase the performance in terms of on-current and off-state current of the device. The SiGe-FeSBFET also provides high Ion/Ioff ratio of 4.188 x 10(12) and low Subthreshold swing of 67 mV/dec in comparison with germanium (Ge) and silicon (Si) material based ferroelectric SBFET. Apart from this, the increasing of tunneling width for the drive of carriers in the drain-channel junction, which results in a reduction of ambipolar conduction in off-state with gate drain underlap. Further, the analog performances of proposed and conventional device are evaluated such as transconductance, intrinsic gate delay, output conductance and cut-frequency which is dependent of parasitic gate capacitances are also investigated through a 2D Silvaco Atlas simulator. (C) 2019 Published by Elsevier GmbH.

By: Sundarasekar, R (Sundarasekar, Revathi); Shakeel, PM (Shakeel, P. Mohamed); Baskar, S (Baskar, S.); Kadry, S (Kadry, Seifedine); Mastorakis, G (Mastorakis, George); Mavroustakis, CX (Mavroustakis, Constandinos X.); Samuel, RDJ (Samuel, R. Dinesh Jackson); Vivekananda, GN (Vivekananda, G. N.)

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Title: Adaptive Energy Aware Quality of Service for Reliable Data Transfer in Under Water Acoustic Sensor Networks

Source: IEEE ACCESS

Volume: 7

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Published: 2019

Abstract: Currently, reliable data transfer, and energy management have been considered as a significant research challenge in the underwater acoustic sensor networks (UWASN) owing to high packet loss, limited ratio of bandwidth with significant incur of energy, network life time with high propagation delay, less precision with high data hold time and so on. Energy saving and maintaining quality of service (QoS) is more important for UWASN owing to QoS application necessity and limited sensor nodes. To address this issue, several existing algorithms such as adaptive data forwarding algorithms, QoS-based congestion control algorithms and several methodologies were proposed with high throughput and less network lifetime as well as the less utilization of energy in UWASN by choosing sensor nodes data based on data transfer and link reliability. However, all the conventional algorithms have fixed data hold time, which incurs more end-to-end delay with less reliability of data and consumption of high energy due to high data transfer reachability. This high end research proposes adaptive energy aware quality of service (AEA-QoS) algorithm for reliable data delivery by formulating discrete times stochastic control process and deep learning techniques for UWSAN to overcome these issues. The proposed algorithm has been validated with conventional state-of-the-art methods and results show that the proposed approach exhibits its effectiveness in terms of less network overhead and propagation delay with high throughput and less energy consumption for every reliable packet transmission.

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By: Manjunath, V (Manjunath, V.); Reddy, NNK (Reddy, N. Nanda Kumar); Veni, KK (Veni, K. Krishna); Suvarna, RP (Suvarna, R. Padma); Ananda, P (Ananda, P.); Lakshmaiah, MV (Lakshmaiah, M. V.)

Title: Impact of annealing process on electrical characteristics of Ni Schottky rectifiers fabricated on p-type Si

Source: JOURNAL OF THE INDIAN CHEMICAL SOCIETY

Volume: 96

Issue: 1

Special Issue: SI

Pages: 85-89

Published: JAN 2019

Abstract: In this work, the electrical parameters of Ni/p-Si SBDs have been investigated using I-V and C-V techniques as a function of annealing temperature. The experimental analysis revealed that the SBHs of the Ni/p-Si SDs are 0.53 eV (I-V) and 0.54 eV (Norde) for as-deposited, 0.56 eV (I-V) and 0.58 eV (Norde) for 300 degrees C, 0.58 eV (I-V) and 0.59 eV (Norde) for 400 degrees C, and 0.50 eV (I-V) and 0.49 eV (Norde) for 500 degrees C, respectively. By performing C-V measurements for the Ni/p-Si SBDs, the SBH values were found to be in the range 0.64-0.59 eV for the as-deposited and 500 degrees C annealed samples, respectively. Further, interface state density (N-SS) values of Ni/p-Si SD is estimated and is noticed that the N-SS values decreases up to 400 degrees C annealing temperature and slightly increases after annealing at 500 degrees C.

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By: Nagappan, B (Nagappan, Beemkumar); Alagu, K (Alagu, Karthikeyan); Devarajan, Y (Devarajan, Yuvarajan)

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Nagappan, Dr BEEMKUMAR	G-3377-2015	0000-0003-3868-0382

Title: HEAT TRANSFER ENHANCEMENT OF A CASCADED THERMAL ENERGY STORAGE SYSTEM WITH VARIOUS ENCAPSULATION ARRANGEMENTS

Source: THERMAL SCIENCE

Volume: 23

Issue: 2

Abstract: Ever increasing energy demand ever encourage for new energy production and conservation. In the present work, the cascaded latent heat solar thermal energy storage system has been developed to deliver the heat at different temperature limits and its performance on the improvement of heat transfer characteristics are studied with the use of multiple phase change material (PCM) with various encapsulation arrangements. The storage system consists of three dfferent PCM which have different melting temperatures such as D-mannitol, D-sorbitol, and paraffin wax. Each PCM is encapsulated in different materials of spherical balls like copper, aluminum, and brass. Permanent welding of fins, inside the encapsulated balls of type rectangular; annular and pin is done for enhanced heat transfer. This work investigates for the best combination of fins which may allow the highest heat transfer rate for the least cost. It has been concluded that the transfer of energy is the highest in the use of copper balls for encapsulation of PCM with the attachment of annular fin inside the balls. With respect to energy cost per kJ of heat transfer, the PCM encapsulated in aluminum balls with annular fins may be preferred. However, in all the combinations, to gain higher efficiency of the system proper arrangements of all system components very close to each other is essential to the provision of perfect insulated storage tanks and the components of the piping circuit.

By: Singh, KS (Singh, Kuvar S.); Tyagi, B (Tyagi, Bhishma)
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Author	Web of Science ResearcherID	ORCID Number
Tyagi, Bhishma	S-5590-2019	0000-0001-9210-383X

Title: Impact of data assimilation and air-sea flux parameterization schemes on the prediction of cyclone Phailin over the Bay of Bengal using the WRF-ARW model

Abstract: The present study investigates the impact of data assimilation for prediction of the landfalling cyclone Phailin (October 8-13, 2013) over the Bay of Bengal by using the Weather Research and Forecasting Advanced Research model and its 3D variational data assimilation system. The impact of the air-sea flux (ACF) parameterization scheme is also tested with an improved model initial condition. Nine experiments were conducted, six with and without data assimilation at three different initial conditions. Three more experiments were conducted with the available ACF parameterization scheme. In all experiments, the lateral boundary conditions were obtained from the Global Forecast System (GFS) at 0.5 degrees x0.5 degrees resolution with a temporal resolution of 3 hr, and the initial condition was taken from GFS analysis. The results suggest that assimilation of observations is beneficial for the forecast of tropical cyclone track and intensity. They show that forecasted storm intensity is highly sensitive during the maximum value of intensity to the parameterization of the ACFs, and higher surface intensity was produced by a large surface exchange co-efficient for moisture. The distribution and magnitude of rainfall and reflectivity of the storm were compared with observed datasets from the Automatic Weather Station and Doppler Weather Radar, respectively. The results show that accumulated rainfall, as well as the structure of the cyclone, are fairly well captured by the model. The predicted higher diabatic heating rate and horizontal eddy diffusivity of heat are also found to be responsible for increasing wind speed of the storm.

By: Viswanath, NMK (Viswanath, Narasimha Murthy Kaipa); Ramachandran, S (Ramachandran, Saravana)
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Author	Web of Science ResearcherID	ORCID Number
Ramachandran, Saravana	M-7810-2016	0000-0002-7360-1179

Title: Unobservable Components Modelling of Monthly Average Maximum and Minimum Temperature Patterns in India 1981-2015

Abstract: The paper deals with modelling and forecasting the behaviour of monthly average maximum and minimum temperature patterns through unobservable components model (UCM) for the period, 1981-2015 in India. The monthly average spatial surface air temperature data was provided by India Meteorological Department (IMD), India using daily gridded temperature data with 395 stations spread over the country. The temperature series is modelled and analyzed separately because the time series plot indicates that the maximum temperature series has sharp peaks in almost all the years, whereas the minimum temperature series has no sharp peaks for all the years. The basic structure model with deterministic level, fixed slope and deterministic dummy seasonal and stochastic auto regressive component for cycle is selected for maximum and minimum temperatures from the parsimonious models of UCM based on Akaike's Information Criteria, Bayesian Information Criteria and significant tests. The model parameters are obtained using method of maximum likelihood estimation, the suitability of the selected model are determined with residuals diagnostics. The forecast of monthly maximum and minimum temperature patterns in India for the 3years has been presented. It is noticed that there is a 0.002 degrees C increase in monthly maximum temperature and 0.0019 degrees C increase in monthly minimum temperature over the years. Further the forecast results indicate that the average maximum temperature increases by 0.1 degrees C in the months of January and May and the average minimum temperature increases by 0.1 degrees C in the December for the years 2016, 2017 and 2018.

By: Dash, S (Dash, Sushmita); Mehar, K (Mehar, Kulmani); Sharma, N (Sharma, Nitin); Mahapatra, TR (Mahapatra, Trupti Ranjan); Panda, SK (Panda, Subrata Kumar)
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Author	Web of Science ResearcherID	ORCID Number
mehar, kulmani	J-9688-2017	0000-0001-5088-6813

Title: Finite element solution of stress and flexural strength of functionally graded doubly curved sandwich shell panel
Abstract: The finite solutions of deflection and the corresponding in-plane stress values of the graded sandwich shallow shell structure are computed in this research article via a higher-order polynomial shear deformation kinematics. The shell structural equilibrium equation is derived using the variational principle in association with a nine noded isoprametric element (nine degrees of freedom per node). The deflection values are computed via an own customized MATLAB code including the current formulation. The stability of the current finite element solutions including their accuracies have been demonstrated by solving different kind of numerical examples. Additionally, a few numerical experimentations have been conducted to show the influence of different design input parameters (geometrical and material) on the flexural strength of the graded sandwich shell panel including the geometrical configurations.

By: Nagumothu, RB (Nagumothu, Ramesh Babu); Thangavelu, A (Thangavelu, Arunnellaiappan); Nair, AM (Nair, Arun Mohan); Sukumaran, A (Sukumaran, Arun); Anjilivelil, T (Anjilivelil, Tomson)
Title: Development of Black Corrosion-Resistant Ceramic Oxide Coatings on AA7075 by Plasma Electrolytic Oxidation
Abstract: Research to achieve dark shade on aluminum surface is a challenge but worthwhile. In this research work, plasma electrolytic oxidation treatment

was carried out on the surface of the AA7075 substrate in different combinations of K2TiF6, (NH4)(6)Mo7O24 and Na2WO4 containing electrolytes so as to fabricate high-absorption black corrosion-resistant ceramic oxide coatings for spacecraft applications. The effect of three different kinds of electrolytes on thickness, morphology, chemical composition, phase composition, thermal control property and corrosion resistance was investigated. The results showed that sample KTW, PEO treated with K2TiF6 and Na2WO4, showed the higher thickness of 29.7m. Scanning electron microscopy surface morphology study revealed that micropores were less for coating KTW than the other PEO-treated samples. Energy-dispersive spectroscopy elemental composition analysis indicated that molybdenum, titanium and tungsten species were incorporated into the coating structure. Dark black colored KTM sample, PEO treated with K2TiF6 and (NH4)(6)Mo7O24, showed lower absorption value in absorption spectra obtained by UV-Vis spectrophotometer. Potentiodynamic polarization study confirmed that higher thickness, less porous and W element containing PEO-treated sample KTW showed excellent corrosion resistance than the sample treated with K2TiF6 (KT) and the sample treated with K2TiF6 and (NH4)(6)Mo7O24 (KTM).

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By: Rao, MCK (Rao, M. C. Karthik); Malghan, RL (Malghan, Rashmi L.); ArunKumar, S (ArunKumar, S.); Rao, SS (Rao, Shrikantha S.); Herbert, MA (Herbert, Mervin A.)

Title: An Efficient Approach to Optimize Wear Behavior of Cryogenic Milling Process of SS316 Using Regression Analysis and Particle Swarm Techniques

Source: TRANSACTIONS OF THE INDIAN INSTITUTE OF METALS

Volume: 72

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Abstract: The present work is an endeavor to carry out a machining using LN2 in face milling operations and to produce the milling samples with excellent wear resistance property. The output response (wear rate) depends on appropriate choice of speed, feed, and depth of cut. The experimental data are conducted (collected) for SS316 as per central composite design. The present work exemplifies an employment of conventional and nonconventional strategies for optimizing the milling factors of cryogenically treated samples in face milling to achieve the desired wear (response). The results of nonlinear regression (desirability strategy) and nonconventional [particle swarm optimization, (PSO)] optimization techniques are compared, and PSO is found to outperform the desirability function approach. The present work even highlights the effect and results of LN2 on wear in contrast to wet condition.

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By: Sahu, AK (Sahu, Atul Kumar); Sahu, NK (Sahu, Nitin Kumar); Sahu, AK (Sahu, Anoop Kumar); Rajput, MS (Rajput, Mridul Singh); Narang, HK (Narang, Harendra Kumar)

Title: T-SAW methodology for parametric evaluation of surface integrity aspects in AlMg3 (AA5754) alloy: Comparison with T-TOPSIS methodology

Source: MEASUREMENT

Volume: 132

Pages: 309-323

DOI: 10.1016/j.measurement.2018.09.037

Published: JAN 2019

Abstract: The authors have proposed a novel Taguchi based Simple Additive Weighting (T-SAW) methodology in this study and investigated its comparison with Taguchi based TOPSIS (T-TOPSIS) methodology for responding towards its validity. The aforesaid two methodologies are implicated for examining turning operations on AlMg3 (AA5754) alloy in CNC Lathe machine using tungsten carbide tool, which are simultaneously implicated under sole manufacturing case for defining metrological comparison, for generating robust decision and for examining the validity of the novel T-SAW methodology. The authors found that both methodologies are imparting analogous parametric conditions i.e. cutting speed at 69.1 m/min, feed at 43 mm/min and depth of cut at 1 mm. Additionally, both methodologies are suggesting depth of cut as most significant and feed as least significant cutting parameter with 65.22% of contribution of depth of cut is reflected by T-SAW and 65.35% of contribution of depth of cut is reflected by T-TOPSIS methodology. It is found that the execution of proposed T-SAW methodology is simple as compared to other Taguchi based MCDM (Multi Criteria Decision Making) techniques and fluently defines effective parametric setting to be implicated under numerous manufacturing processes. An easy executable Multi Objective Optimization (MOO) framework is presented, Multi Response Performance Indicator (MRPI) is generated, parametric optimization of surface integrity aspects i.e. metal removal rate and surface roughness is presented, technical features for modeling T-SAW and T-TOPSIS methodologies are illustrated and the importance of cutting parameters for achieving output parameters is discussed in this study for cataloging rationalized experiments. (C) 2018 Elsevier Ltd. All rights reserved.

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