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1. Some Properties of a Class of Salagean-Type *P*-valent Functions (pages 1- 7)

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Abstract

In (2008)G *ü* neyintroduced and investigated the subclass $T_p^*(g(z), \alpha, \beta, \gamma, A, B, \lambda)$ consisting of analytic and *p*-valent functions

with negative coefficients using a differential operator $D^\lambda = p^\lambda z^p - \sum_{k=1}^{\infty} (p+k)^\lambda a_{p+k} z^{p+k}$ andderived the

coefficient inequalities, distortion theorem and extreme points for $T_p^*(g(z), \alpha, \beta, \gamma, A, B, \lambda)$. The purpose of present work is to derive some interesting properties other than those obtained by G *ü* ney for the subclass. In particular, we derive quasi-Hadamard product (quasi-convolution) property, inclusion theorem, radius of close-to-convexity, star-likeness and convexity properties for $T_p^*(g(z), \alpha, \beta, \gamma, A, B, \lambda)$.

2010 ***Mathematics Subject Classification.***30C45, 26A33
Keywords and Phrases: Analytic, *p*-valent, Quasi-Hadamard product, Salagean operator, close-to-convex function, coefficient inequalities.

2. Some incomparability characteristicsofpartially ordered sets (pp9-10)

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Abstract
There is a need to find an adequate way of handling incomparable partially ordered sets for implementation in order theory. Wepresent here some useful results. The results, which are more or less*element-centred*, describe the consequences and criteria for incomparability among partially ordered sets.

Keywords: set, partial order, incomparability, maximal element

3. Reduction of Generalized Forbidding Grammars

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Abstract: In this paper, we improve the upper bounds of certain descriptional complexity measures of generalized forbidding grammars. We prove that a generalized forbidding grammar of degree 2 with no morethan 6 conditional productions and 8 non-terminals is sufficient to generate the class of recursively enumerable language. This result is based on the common idea of using the so-called Geffert normal forms for phrase structure grammars.

Key words: descriptional complexity, generalized forbidding grammars, formal languages

4. **SOME FURTHER PROPERTIES FOR ANALYTIC FUNCTIONS WITH RESPECT TO OTHER POINTS WITH VARYING ARGUMENT**

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Abstract

Some further properties for analytic functions with respect to other points with varying argument were discussed. The coefficient bounds, coefficient inequality, majorization, distortion bounds, extreme points and radius of close-to-convexity, starlikeness and convexity for the functions belonging to the class $TU_{\gamma}S_{s}^{*}(\alpha, A, B)$ and $TU_{\gamma}S_{c}^{*}(\alpha, A, B)$ were obtained.

Mathematical Subject Classification: 30C45, 30C50, 26D15.

Keywords: Analytic Function, Varying Argument, Subordination, Coefficient Bounds, Distortion Bound, Coefficient Inequality, Majorization Conjugate Point, Symmetric Point.

5. Application of Matrices to the Theory of Games

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Abstract

In this paper, formation of payoff matrix of games and evaluation of saddle points of games is obtained. In addition, determination of strategies used by players in a game as well as the expected payoff of a player is obtained.

Key Words:*Matrices, Theory of Games, Saddle Points, Payoff of a Player, Strategies of Players.*

6. Monodromy matrices analysis approach of stability of solutions of certain systems of linear differential equations with periodic coefficients

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Abstract

This workfocuses on the analysis of conditions of stability of single second order and single third order linear differential equations with periodic coefficients by carrying out reduction procedures on their respectivemonodromy matrices when their fundamental matrices are principal.

Keywords and phrases: Eigenvalue, Stability, Asymptotical stability, Monodromy matrix, Periodic Coefficient.

7. EXISTENCE AND STABILITY OF PERIODIC SOLUTIONS FOR A CLASS OF SECOND ORDER NONLINEAR DIFFERENTIAL EQUATIONS

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Abstract.

In this paper, the hypotheses of implicit function theorem and Lyapunov functions are applied to study existence and stability of periodic solutions for a class of second order nonlinear Duffing-type equation. Under appropriate conditions around the origin, a unique periodic solution and asymptotic stability are obtained.

Keywords: Implicit Function theorem, Lyapunov Stability, Cartwright Method, Periodic Solutions, Mathcad Software.

2010 Mathematics Subject Classification: 34B15, 34C15, 34C25, 34K13

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8. COMPARATIVE ANALYSIS OF SOME METHODS OF LYAAPUNOV CONSTRUCTIONS FOR THE CUBIC DUFFING OSCILLATOR-THE HARD SPRING MODEL

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Abstract.
In this paper, three different methods of construction of Lyapunov functions for Duffing-type equation were adopted and compared. Under appropriate consideration, similar results were obtained using different techniques for the hard spring system.

Keywords: Lyapunov Construction, Duffing Oscillator, The hard Spring Model

2010 Mathematics Subject Classification: 34B15, 34C15, 34C25, 34K13

9. APPLICATION OF SYSTEM OF LINEAR EQUATIONS TO A 3-ARM ROUNDABOUT NETWORK FLOWS

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ABSTRACT

A mathematical model was presented and used to determine turning movements at roundabouts based on field data. Assumptions were made in order to simplify the model; such as no U-turns from and to the same arm of a roundabout, total traffic into the roundabout is equal to total traffic out of the roundabout and traffic is homogenous (i.e. mainly consisting of vehicles). Using Gaussian elimination, turning movements could be estimated for 3-arm roundabouts for the indeterminate traffic steam movements when inflows and outflows for each arm of the roundabout is known together with a flow stream on one internal circulating (weaving) section between any two arms of the roundabout. The model has practical use in reducing the number of detectors or counters (whether automatic, videoing techniques or manual methods are in use) which are needed in collecting data to determine the estimated flows from and to the different parts of a roundabout. The reduction in the number of detectors (or traffic counts) could be due to site limitations caused by faulty or limited number of counters used, inaccessible sections for obtaining video images for later analysis (e.g. presence of sharp bends buildings or large trees obscuring vision). The benefits of saving costs could be significant in terms of time and man-power needed on site and this could depend on the amount of traffic flow through the roundabout.

Keywords: roundabouts, traffic, detector, inflows, indeterminate and outflows.

10.Finite Element Technique to the Optimal Control of Two Dimensional Wave Equation with Energy Effect. BAWA M.

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Abstract

This research work considers the optimal state and control of the two dimensional wave equation with energy effect using the Finite Element Technique (FET). The findings in the one dimensional case hold. In addition, the two and three element discretization depict only positive states with negative controls. Other levels of discretization were also considered.

Keywords

Finite Element Technique, Wave Equation, Optimal Control, Optimal State, Element Characteristic Matrix, Differential Equation.

11. Analytical Solutions and Moments Analysis of Two-Dimensional General Rate Model for Chromatographic Columns of Cylindrical Geometry Considering Dirichlet Boundary Condition

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Abstract

This work is concerned with the analytical solutions of a two dimensional general rate model simulating liquid chromatographic process in a cylindrical column considering dirichlet boundary condition at the column inlet and outlet. A single-solute model is considered using linear isotherm and pulse injection of finite width at the column inlet. The finite Hankel and Laplace transformations are used simultaneously to solve the model equations. Since the analytical Laplace inversion in the actual time domain is not possible, the numerical inversion is applied. To further analyze the effect of different kinetic parameters on the elution profiles, the first four temporal moments are derived analytically from the solutions in the Laplace domain. These moments can be used to analyze the retention times, band broadenings, front asymmetries and flattening of the elution profiles. The derived solutions will be useful to optimize the process and analyze the effect of involved mass transfer processes.

Key words: General rate model, moments analysis, mass transfer, linear isotherms.

A Method for Solving Interval Systems of Linear

Equations

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ABSTRACT

The system of linear equation has a great importance in many real life problems such as economics, optimization and in various engineering field. We know that system of linear equations, in general is solved for crisp unknowns. In actual case the parameters of the system of linear equations are modeled by taking the experimental or observational data. So the parameters of the system actually contain uncertainty rather than the crisp one. The uncertainties may be considered in term of interval number.

Recently different authors have investigated these problems by various methods. Although solutions obtained by these methods are good but sometimes the method requires lengthy procedure and computationally not efficient.

In this paper we propose an exact method for solving interval system of linear equation. We have tested the method and it is producing a better result in comparison with the existing ones.

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12. ON THE KINEMATICS OF WAVE PARAMETERS IN A MEDIUM WITH VARYING CHACTERISTICS.

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Abstract:

The study concernsthe evolutions of wave parameters in a slowly varying medium, for example,ideal fluid medium. It re-establises that the group velocity tends to modulation velocity as both the frequency and wave number spectral bandwidthstend to zero.

Further, in the slowly varying medium, it is established that both the wave length and period are governed by quasi-linear partial differential equation for the hyperbolic system.A rather more generalised concept of group velocity is also suggested.

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13. On the Uni-direction Model of Extreme Wave Profile for Freak Wave Events Induced by the Ocean Current.

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[2]Department of Mathematics, University of Benin, Benin City, Edo State, Nigeria.

Abstract

This study is essentially on the theory of ocean waveinduced by current in deep water. Both frequency, group and phase velocity dispersion curves were analyzed and displayed. Using non-dimensional wave parameters, it is deduced mathematically that the inducing ocean current and the interacting sea wave must be in opposition with regards to their respective phase speed. This result is in agreement with observation. The wave number at the point of blocking is calculated and deduced to be a function of the current speed.

A one–dimensional ray equations governing the evolution of wave packet interacting with ocean current in addition wasanalyzed. The solution confirms the existence of the focusing point earlier mentioned. The distance for which the monochromatic wave packet can penetrate into the current

before being halted by opposing ocean current is also derived. At the blocking zone (caustic), it is proved in this study that, not only is the wave amplitude very large, the wave-length which is then proportional to the square of current velocity is similarly large. This is more pronounced in the event of strong ocean current.

Keywords; Rogue wave, Ocean current, Dispersion, Caustic, Wave packets.

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14. PIECEWISE CONTINUOUS TRIAL FUNCTIONS IN THE FINITE ELEMENT SOLUTION OF ONE DIMENSIONAL FIELD PROBLEM USING RAYLEIGH-RITZ METHOD

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Abstract

One the flaws of the traditional variational methods is that the trial functions are arbitrarily chosen and the weighted integrals are applied globally over the entire region of interest. Consequently for complex regions , the boundary conditions as well as the physics of the problem are not satisfied.

In this paper, we present the finite element method, it is an element wise application of the Rayleigh-Ritz method. its essence is the minimization of an appropriate functional, which is developed on adoption of the Euler –Lagrange's equation. The discretization of the region of interest is done using linear elements permitting a close approximation at discrete nodes. The element functional minimization results in a series of algebraic equations which on assembly using the direct stiffness method yields the system equation. The required nodal degree of freedom is obtained after imposing the boundary conditions

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15. AN EFFICIENT FINITE ELEMENT MODEL FOR TWO DIMENSIONAL FIELD PROBLEMS USING GALERKIN WEIGHTED RESIDUAL METHOD

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Abstract

An efficient numerical procedure of dealing with boundary value field problem is presented. The method is based on the finite element method. Its essence is the minimization of the error (residual) due to approximation in a weighted sense and is an element wise application of the Galerkin weighted method. The weighted residual integral gives a set of element algebraic equations, describing the variation of the function of interest at various discrete nodal points.

The assembly of the element equations using direct stiffness method gave a global system of equations (the model) which upon imposing the boundary conditions gave the desired nodal degree of freedom.

The solution and post process of finite element method of this study showed that once the stiffness matrix of a continuum is established and the boundary conditions specified, the continuum is solved uniquely.

The heat transfer problem was solved using our new model and the result obtained was seen to compare favorably with their closed form analytical solution.

16.On the Effect of poliomyelitis and immunity in poliovirus epidemiology and the Role of Vaccine.

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Abstract

In this paper, we studied the mathematical modeling of the effect of poliomyelitis and immunity in poliovirus epidemiology. It centers on the application of mathematics as a tool in explaining the dynamics of poliovirus transmission. The study is based on understanding the role of Vaccine. This work focuses on rate of Vaccine and the chronicle stage of the virus tested for the existence and uniqueness of solution for the model using the Lipchitz condition to ascertain the efficacy of the model and proceeded to determine both the Disease Free Equilibrium (DFE) and the Endemic Equilibrium (EE) for the system of equations. We have seen that the system equations has a Unique solution. The local stability of the (DFE) of the model was obtained using the Variational Matrix Criteria while the stability of (EE) was analyzed. The reproduction number was calculated and simulated. We demonstrated that the disease will die out, if the basic reproductive numbers for the disease free equilibrium $R_0 < 1$. This is the case of a disease free state, with no infection in the population. Otherwise the disease may become endemic if the basic reproductive number R_0 is bigger than unity (i.e $R_0 > 1$). The basic reproduction number at both the disease Free State and the endemic state were obtained and the result shows stability in the role of Vaccine as a means of reducing the spread of the disease in the society.

Keywords: poliovirus, DFE, EE, Symptoms, model, stability

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17. Chemical Reaction Effect on Natural Convective Flow between Fixed Vertical Plates with suction and injection

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ABSTRACT

This study investigates the effect of chemical reaction on natural convective flow between two fixed vertical porous plates. The continuity, momentum, energy and concentration equations were used as the governing equations. The dimensionless forms of the equations were solved analytically using Perturbation method in

order to obtain the velocity, temperature and concentration. Expressions forthe Skin-friction, Nusselt number and Sherwood number were derived. Furthermore, Effects of assisting free convective current Grmagnetic field$M$, Prandtl number Pr, chemical reaction$R$ suction/injectionδ, sustention parameter N and Schmidt number on heat and mass transfer in the flow were discussed and presented graphically. **KEYWORDS:** Chemical Reaction, suction /injection, Natural Convection, Vertical plates.

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18. Unsteady free convective flow in a porous medium with heat generation in an infinite vertical plate

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Abstract

This paper investigates the unsteady free convective viscous incompressible and electrically conductive fluid, between infinite vertical porous plates due to heat generation and Hartmann number. Solutions of time dependent energy, momentum and concentration equations under the relevant initial and boundary conditions were derived using perturbation technique. Selected set of line graph representing the effect of controlling parameters embedded in the problem are discussed during the course of numerical computation. It is observed that, an increase in Gr and Gc results in the thickening of the thermal boundary layer, which leads to an increase in the unsteady velocity layer. However, a raise in the magnitude of the Hartmann number M, leads to a decrease of velocity.

Nomenclature	U' Dimensional velocity of the fluid
U Dimensionless velocity of the fluid	g Acceleration due to gravity

$\Pr$ Prandtl number	t' Dimensional time
C' Dimensional concentration of the fluid	C Dimensionless concentration
y' Dimensional co-ordinate perpendicular to the plate	y Dimensionless co-ordinate perpendicular to the plate
S Dimensionless heat sink parameter	T_∞ Initial temperature
Q Dimensional heat sink parameter	Gr Thermal Grashof number
K Permeability parameter	Sc Schmidt number
C_∞ Concentration of the fluid far away from the fluid	C'_w Constant concentration at the plate
γ Suction	Gc Mass Grashof number
T_∞ Temperature of the fluid far away from the plate	T_w Temperature of the fluid near the plate
B_0 External magnetic field	M Magnetic parameter
Greek alphabets	
β Volumetric coefficient of thermal expansion	ν Kinematic viscosity
ρ Density of the fluid	σ Stefan Boltzmann constant (electrical Conductivity)

Keywords: Free convective flow,Porous medium,Haet generation, Infinite vertical plate.

19. A study of crude oil prices, exchange rate, interest rate and stock market volatility in Nigeria

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Abstract

This paper consideredtheproblem ofdeterminingtheimpact ofpriceofcrudeoil,exchangerate andinterest rate volatilityontheNigerian Stockexchangemarket.Themultifactormodelisusedtoevaluate theeffect ofthe selectedmacroeconomicvariables and thestock market volatilityusingdata fromJanuary2005to December2013. Thetest forstationaritywasperformed usingAugmentDickeyFuller(ADF) unitroottest andordinary leastsquarewasemployedtodeterminetheparametersofthemodel. Theresultofthisstudyrevealedthatthevolatilityoftheselectedmacroeconomic variables greatly affectstheNigerianstockmarket

Keywords: Macroeconomic Variables, Volatility,StockReturns,Liquidity, hedgeratio, factor betas, Nigerian StockExchange.

20. Hybrid of ARIMA-ARCH Modelling of Daily Share Price Data of Okomu Oil Plc in Nigeria

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ABSTRACT

The aim of this work is to study and develop an appropriate time series model for the residuals from the autoregressive integrated moving average (ARIMA) model derived from the daily stock data of Okomu Oil.

The autocorrelation structure of the residuals and the squared residuals were examined. The Box-Ljung test, Box-Pierce and McLeod-Li test were applied to the residuals and squared residuals from the ARIMA model. These tests revealed the presence of conditional variance (volatility) in the residuals from the ARIMA model. The autoregressive conditional heteroscedastic (ARCH) models were then applied in modelling this volatility.

Our results showed that the ARCH (5) model was best (having the smallest AIC) giving rise to a hybrid ARIMA-ARCH model. This model better explains and captures the dynamics of the daily stock price of the company being studied.

Keywords: ARCH, McLeod-Li test, Akaike Information Criterion, volatility, autocorrelation function, Okomu.

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21. A COMPARATIVE STUDY OF K-MEANS AND K-MEDOIDS CLUSTERING METHODS.

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ABSTRACT

The aim of this work is to provide a formal and organized study of the effect of the nature of data and cluster structure on the performance of K-means and K-medoids clustering methods. A cluster validation method called Silhouette analysis is used to assess the quality of cluster partitions created by both methods. An illustration on how Silhouette analysis could be used to determine the optimal number of clusters in a data set is presented. Results obtained reveal that the performance of K-means is at its peak with data in which clusters are of relatively uniform sizes while the K-medoids method tends to perform better than K-means when the input data have varied cluster sizes.

Keywords: Cluster Analysis, Cluster Validation, Distance Functions, K-means, K-medoids, Silhouette Analysis

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22. OPTIMAL EXPECTED VALUE OF ASSETS UNDER PARABOLIC EQUATION WITH MARKET PRICE OF RISK NOT ZERO

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ABSTRACT

This paper deals with optimal expected value of assets under parabolic equation when the market price of risk is not equal to zero. A seemingly Black-Scholes parabolic equation was obtained and then solved using Euler's substitution method when the market price of risk is not zero. We then used our result for the optimal prediction of the expected value of assets.

Keywords: *Fractal scaling exponent, Black-Scholes equation, Assets price return, optimal value, parabolic equation.*

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23. Mathematical Model on Premium Motor Spirit Dispensing: The Nigeria Situation

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Abstract

This paper focused on the problem of under dispensing (under delivery) ofpremium motor spirit (PMS) otherwise called FUEL, the effectand remedy. The short, medium and long term approaches as it affects the Nigeria consumers. The objective of this paper is to develop comparative models for dispensing pms with little input from the regulatory agencies. The

aim of this model is to dispense the exact quantity ofpms in litersto potential customers. This model will enhance car parts manufacturing firms or automobile manufacturing companies to develop and installed the device in future cars. The device read correspondingly with the exact measureable quantity oflitersbased on the department of petroleum resources (DPR) measuring device (Seraphin Can in digital form).It indicates the number of liters of pms left in the vehicle and also indicate the quantity of pms purchased instantly. The implication is that every Nigerian purchasing pmswill be confident of the exact quantity of fuelpurchased; this on the other hand will reduce the cost of monitoring private pms marketers that engaged in sharp practices. In general, we proposed that in the near future all vehicles should be designed to have this device installed. The advantage of this model is numerous, it is capable of indicating precisely the quantity of pms consumed from Warri to Lagos and otherwise.It also reveals the pms dispensing stations with slow burning fuel (quality fuel) and fast burning fuel (adulterated fuel), this will enable potential customers to patronize the best pms stations. In general, the model has numerousadvantages and few disadvantages. One of suchdisadvantage maybe argument over which of the measuring device is accurate or not hence this is the area government and its regulatory agencies need to support this project.

Keywords: Premium motor spirit; Dispensing; Under dispensing;Liters; Device

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24. Radial Solution of the s-wave D-Dimensional Non-Relativistic Schrodinger Equation for Generalized Manning-Rosen plus Mie-type NucleiPotential within the framework ofNikifarov-UvarovMethod.

[1]B. I. Ita., [2]B. E. Nyong.,[1]H. Louis.,[1]T. O. Magu.,[1]N. A. Nzeata-Ibe and [1]S. Barka

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ABSTRACT

We present the bound state solution of Schrodinger equation in $D-dimension$ for generalized Manning-Rosen plus Mie-typepotential using the generalized parametric Nikiforov–Uvarov method to obtain the energy levels and the corresponding un-normalizedeigenfunction in closed form. The energy eigenvalues for different conditions of potential consideration and the numerical analysis for the calculated eigen energy are also computed.

Keywords: Schrodinger equation, Mie-type plus Manning-Rosen potential, Nikifarov-Uvarov Method.

Approximate Solution of the N-Dimensional Radial Schrodinger Equation for Kratzer plus Reduced Pseudoharmonic Oscillator Potential within the framework of NU-Method.

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ABSTRACT

We solved approximately the bound state solution of the N-dimensional radial Schrodinger Equation for kratzer plus reduced harmonic oscillator. We obtained explicitly the energy eigenvalues and the corresponding eigen functions expressed in terms of the Jacobi polynomials

Keywords: Schrodinger Equation, Kratzer, Reduced Pseudoharmonic oscillator potential, Nikiforov-Uvarov.

25. The use of Fractional Derivativesto Generalize Hooke's and Newton's Laws by the Scott Blair's Model

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ABSTRACT

In this paper, some pioneering roles of the British scientist G.W. Scott Blair in the formation of the applications of fractional modelling in rheology are discussed. Further development of this branch of science and some other few aspects in which fractional calculus are applicable are also briefly investigated. We used two methods in the construction of fractional model of a viscoelastic fluid via Maxwell model. The first method is a direct one while in the second method the fractional elements are determined by three parameters which leads to the constitutive equation of Maxwell model.

KEYWORDS: Viscoelasticity, Rheology,Scott Blair's model.

26. Determination of configurational setting, Ground state Cohesive energies and Harmonic vibration of $Al_8Cu_4Fe_1$, $Al_{27}Cu_{10}Fe_5$ and $Al_{34}Cu_{14}Fe_7$ Icosahedral Clusters Using Fhi-aims Code

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Abstract

Quasicrystals are material with perfect long-range order, but no three-dimensional translational periodicity. They are typically binary and tenary metallic alloys. Metropolis Monte Carlo rules were used for the study of configurational settings of Mackay icosahedrons clusters with compositions $Al_8Cu_4Fe_1$, $Al_{27}Cu_{10}Fe_5$ *and* $Al_{34}Cu_{14}Fe_7$ *.Fhi-aims code was used to study the Total energies, Cohesive energies and Harmonic vibrations of the clusters. It was found that the position of iron and copper were found at vertex 9 and 5 respectively with the transition probability of 1.0022354058 and 0.9301126399 for the first Mackay shells. Also with packing techniques the second and third clusters were formed. -2.68638.6363293350eV, -843443.1972839070eV and -1101611.5411331500eV were obtained from the result of geometry optimization of* $Al_8Cu_4Fe_1$, $Al_{27}Cu_{10}Fe_5$ *and* $Al_{34}Cu_{14}Fe_7$ *with default Fhi-aims setting. With highest basis size 62, it was found that the total energy of the clusters are -268652.3373186230 eV, -843492.9531392190eV and -1101676.4791576700eV. For the cohesive energy per atom, it was found that* $Al_8Cu_4Fe_1$, $Al_{27}Cu_{10}Fe_5$ *and* $Al_{34}Cu_{14}Fe_7$ *clusters have 2.7eV, 3.1eV and 3.4eV respectively withHOMO-LUMO gaps of 0.41594094 eV,0.09191654 eV and 0.09281146 eV .However the result of finite difference method for the calculation of infrared spectra for the clusters, shows that;* $Al_8Cu_4Fe_1$, *spectra have peaks at 94.2, 120.9, 136.5, 157.5, 173,193.9, 207.6 and 328.9 cm*$^{-1}$, $Al_{27}Cu_{10}Fe_5$ *spectra have peaks at 51.3, 66.4, 77.6, 112.2, 161.4, 171.6, 196.9, 231.5, 288.9, 331.8 and 470.1cm*$^{-1}$ *and* $Al_{34}Cu_{14}Fe_7$ *have peak at 38, 64, 99 135, 162, 232, 239, 286, 313, 335, 460, 496, and 516 cm*$^{-1}$*. Also the range of the frequency spectra for the clusters increases as the number of the atoms increases in the cluster. The result of the spectra were compared with the result in the literature.*

Keys: Quasicrystals, Icosahedron, Metropolis Monte Carlo, Cohesive Energy, IR-spectrum and Zero-Point-Energy

27. ANALYSIS OF PERIODIC INFLUENCE OF SOLAR ACTIVITY ON WINDSPEED FOR WIND ENERGY APPRAISAL IN SOME CITIES IN NIGERIA

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ABSTRACT

In this study, the effects of solar activity on wind speed in some cities in Nigeria were investigated by examining the Periodicity of the mean monthly values of wind speed and solar index using the Spectral Analysis Method (SAM). Results revealed that the dominant periodicity that appeared with the analysis shows some similarities between periodicity of the windspeed data set and that of solar activity.The modal periodicities associated with solar activity areidentified at all the seven meteorological stations. In some stations the associations are influenced by local effects like vegetationdifferences, proximity to the oceans and topography.Impact of solar activity forcing is more pronounced on wind speed at the northern part of the country because it exhibited higher variability in its periods.

Keywords: *Solar Activity, periodicity, Wind speed and Wind Energy*

Title: Evaluation of Natural Radionuclide and Dose Assessment in Soil around Aluminium processing industries in Sango-Ota, Nigeria

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Abstract

The activity concentrations of natural radionuclides ^{226}Ra, ^{232}Th and ^{40}K in soil samples collected from four aluminium processing industries in Sango-Ota, Nigeria were measured by gamma spectrometry using high-purity germanium detector. The values of ^{226}Ra, ^{232}Th and ^{40}K in the samples ranged from 5-10, 2–4 and 148-200 Bqkg^{-1}, respectively in aluminium waste and 16 – 69, 17-87 and 101-562 Bqkg^{-1}, respectively, in the soil samples. All the mean activity concentrations of the radionuclide in the samples are lower than the world average

except for ^{226}Ra which is slightly higher in soil. The radium equivalent activity concentrations and the absorbed dose rates in the samples are below the recommended values. The calculated external and internal hazard indices are less than unity as required. The annual gonadal dose equivalents in all the samples are lower than the world average. The mean annual effective dose in aluminium waste samples is 17.9 and in soil 53.2 μSvy^{-1}, which is lower than the 1 $mSvy^{-1}$ recommended for the general public. The estimated fatality cancer effect is lower than the UNSCEAR limit. The results obtained show that the workers and the public are not at risk as far as radiological hazard is concerned.

28.A Review on Computed Tomography in Comparison with Ultrasound Imaging Technique: A Case Study of Rasheed Shekoni Specialist Hospital Dutse,Jigawa State

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Abstract

A comparism of the computed tomography and ultrasound imaging techniqueswere studied by using the 2015 radiological data ofRasheed Shekoni Specialist Hospital, DutseJigawa State. Based on this research, the mean data of the computed tomography was found and calculated to be 27.83 and that of the ultrasound one was 161.42 with a difference of 133.59 between them. This indicated that the enrolment of ultrasound imaging is much greater than that of computed tomography. And it is because computed tomography involves the use of ionizing radiation (X-ray) which is hazardous to human body. But ultrasound imaging involves the use of high frequency sound that has no any advert to human body.Besides, it was equally shown that the common examinations related to computed tomography and ultrasound imaging are; Abdominal imaging, where 10 millisievert (mSv) in computed tomography examination is equivalent to 2.5 Mega-Hertz (MHz) in ultrasound one, Pelvic imaging, where 10 mSv is equivalent to 5 MHz, Spine (Musculoskeletal) imaging, where 1.5 mSv is equivalent to 15 MHz, and Coronary (Vascular) imaging, where 12 mSv is equivalent to 5 MHz, respectively. The variation in frequencies between different parts of the human body during ultrasound imaging was also analyzed using frequency, wave length, and velocity related equations[see (equation 1), and equation 2)].

Keywords:Medical Imaging; Computed Tomography; Ultrasound Imaging; Musculoskeletal; and Coronary Imaging.

29. Specific heat and compressibility of quasi-particles in metals.

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Abstract

In this paper the specific heat and compressibility of quasi-particles were computed based on the modified Landau theory of Fermi Liquids using the electron density parameter. The Landau Fermi liquid

theory's basic idea is to compare the excited states of the quantum liquid with those of the free Fermi gas. The excited states of the system consist of states where one or more fermions are excited to higher energy states. The method was used to compute the specific heat and compressibility of quasi-particles for some metals. The result obtained revealed that as temperature increases the specific heat of quasiparticles in metals increases. For compressibility, at high density region, there is good agreement between experimental compressibility of metals, computed and Landau values for compressibility of quasi-particles while at low density limit, the level of disagreement between them increases with increase in electron density parameter.The Landau Fermi liquid theory overestimated some properties of quasi-particles, which are supposed to be a contribution to bulk properties of metals. But the modified Landau Fermi liquid theory give a better estimation of the contribution of quasi-particles to the bulk properties of metals when compared with experimental values. The agreement between the computed results and experimental valuesrevealed that the introduction of the electron density parameter in the Landau theory of Fermi Liquidsis promising in predicting the contribution of quasi-particles to the bulk properties of metals.

Keywords: Quasi-particles, Specific heat, Compressibility, Fermi liquid, and Electron density parameter

30. The observed relationship between Ozone layer with Meteorological Parameters and Solar Indices.

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Abstract

The relationship between the Ozone layer and meteorological parameters (rainfall, relative humidity, cloud cover, maximum and minimum temperature), also the contribution of Ozone layer with solar indices (sunspot number and solar flux) were examined for 12 years (1999-2010) for Ikeja over Nigeria. The enhancement of surface ozone concentration has been observed in association with the increasing sunspot numbers. This feature is more significant in May, July, September and October. We observed strong correlations between the Ozone layer with rainfall, relative humidity, cloud cover, maximum and minimum temperature with values of 0.531, 0.668, 0.512 0.586 and 0.551 respectively. The relationship between Ozone with sunspot number and solar flux were 0.677 and 0.474. The accuracy of the regression is tested by computing MBE, RMSE and t-test statistic for each of the variables with standard techniques..

Keywords: Ozone layer, solar flux, sunspot number and meteorological Parameter

31. ESSENTIAL ROLE OF SURFACTANT ON TITANIUM DIOXIDE - ROSELLE DYE SENSITIZED SOLAR CELL

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ABSTRACT

In this approach the Blade-Method was employed to fabricate TiO_2-Roselle Dye Sensitized solar Cell with different surfactants by using the natural harvestable Roselle dye to replace ruthenium complex. The vinegar + gum acacia happened to be the best surfactants with overall short circuit current and open circuit voltage of I_{sc}=80.06µA and V_{oc}=0.41V, 22.87 µA and 0.18V under the sun and under illumination respectively.

***Keywords*:** Dye Sensitized Solar Cell, Roselle, TiO_2, ITO, Gum Acacia

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32. Application of thermal conductivity/ steady state method in estimating length of metal rods

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ABSTRACT

The paper describes the application of knowledge of thermal conductivity to investigate the variation of length with quantity of heat flow in the metals. The method used is the steady-state techniques, which determines the unknown lengths of metal rods using the amount of heat-transfer in known lengths. The selected rods used in this study are Brass rods, iron rods and stainless steel rods with different thermal conductivities. Each of the metal rods was cut into three different lengths; the longest which is 22.0 cm was set as known, while the other two lengths were referred to as unknown (been the length to be determined). Estimation of lengths of the rods were made by measuring the amount of heat-transfer rate in the known

length of the same type metal rod. The knowledge of heat-transfer rate and Fourier law were employed to determine the lengths of other (unknown) rods. The calculated lengths agreed with the actual values of the lengths of the rods values within 93 to 99.33 percent. The results obtained from the experiment showed that the amount of heat-transfer in the rods depend on the lengths, sizes, and the materials from which the rods were made.

Keywords: Thermal Conductivity, metal rods, heat-transfer rate, Steady State method

33. DETERMINATION OF HEAVY METALSOF ENVIRONMENTAL CONCERN USING NUCLEAR ACTIVATION TECHNIQUE

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ABSTRACT

Samples of soil were collected at three (3) sites in the Zaria region, northwest part of Nigeria.The elements determined in different soil samples of areas of interest using instrumental neutron activation analysis (INAA) method are Co(5.85ppm), Cr(28.87ppm),Mn(321.65ppm), Th(45.35ppm), U(37.53ppm), V(28.55ppm), and Zn (58.61ppm).Generally, neutron activation is most reliable tool for determining the concentration of heavy metals by measuring the gamma rays released from decay of the radioisotopes created from the interaction of (neutrons with atoms. In this study, the soil contamination level of all heavy metals and trace elements was compared to the range, mean, and median values of the World soil.Heavy metals such as Th and U have values greater than the world median value.

Keywords: Nuclear Activation Method, Heavy Metals of Environmental Concern and Soils

34. Evaluating Pathloss Propagation Using Okumura-Hata Model for Surulere Area in Lagos State, Nigeria.

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Abstract

Good network performance in any wireless network which is a measure of the strength of signal received is of a great concern to the network provider. The desire in this research work is to use a Path loss Propagation Model that can help in planning better Global System for Mobile Communication (GSM) network. The data used were collected via drive test. The down link signal level were collected using test phones, TEMs investigating software (Agilent technology) and info maps. The base station antenna height is 30m and mobile station antenna height is 1.5m and the average Path loss was measured to be 147.76dB.

Comparison was made between measurement results and Prediction Model (Okumura-Hata Propagation Model) with GSM network at a frequency of 1500MHz. The results were consistent with the Okumura-Hata Model for Path loss Propagation with a little deviation which is as a result some macroscopic parameters and this will provide a plat form to aid in system optimization process for improve performance also for characterization of the quality of radio coverage.

Key words: Drive Test, GSM, Path loss, Okumura-Hata Model, TEMs

35. Path Clearance Effect On MicrowaveRadio Link Within 11km Path Length and 2GHz-20GHz Signal Frequency

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Abstract

*Path clearance has significant effect on communication links utilizing Microwave frequencies that exhibit Line-of-Sight (LOS) mode of propagation. Ideally, microwave signals in UHF, SHF and EHF bands propagate wireless signals in a straight-line passion known as LOS using directional antennas. This paper presents the effect of path clearance on 2GHz to 20GHz range ofsignal frequencies in steps of 2GHz, 5GHz, 10GHz, 15GHz and 20GHz along a signal path length of 11km from Bayero University Old Campus to Langel Village, Kano-Nigeria. The tworadio sites (A and B) are located at Old CampusBayero University, Kano N11^{0}58'40.0" E8^{0}28'35.0"489m (a.s.l) and LangelVillageN 11^{0}58.30.0' E 008^{0}22.20' 476 (a.s.l)Kano Northern-Nigeria. Path length and coordinates were measured using Germin eTrex20 GPS system with WGS-84 standard. Furthermore, the microwave signal degradation due to path clearance effect at different signal frequencies was considered. The simulation results obtained are presented in terms of received signal level, obstruction loss, fade margin, free space loss and Netpath Loss. The observed degradationdue to obstruction and other losses along the signal path were calculated using ITU-R Rec. models. It was found that; for clear LOS link from Bayero University Old Campus to Langel villageanantenna height of 35m sufficeson both sites for normal atmosphere and minimum transmission requirements with 0dB obstruction loss. These tower heights are sufficient for the transmission at any given signal frequency and obstacle (trees, mountains and buildings) heights of up to 12-meters. The Netpathloss and free space loss increase with increase in signal frequency, which leads to decrease in the received power level above the threshold of -70dB level.*The link satisfied the clearance criteria with 0dB obstruction loss and more than 0.6F1 clearance with addition of up to 6m-to-7m obstructions. The clearance increase in as the frequency increases.

Keywords: *Microwave, Signal, Fading, Frequency, obstruction, loss, Line-of-Sight*

36.EFFECT OF ENCAPSULATING MATERIALS ON DETECTION OF AMMONIUM NITRATE EXPLOSIVES

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Keywords: Explosive, Ammonium nitrate, Container, Thickness, Detection, MCNP

Abstract. The study investigated the effect of encapsulating materials (containers) on detection of ammonium nitrate explosives. Fast neutrons analysis was employed in interrogating the explosive encapsulated in ceramic, HDPE, steel and wooden containers having thicknesses ranging from 0.5 cm to 5 cm. The study was carried out by means of computer simulation using MCNP simulation code. Key findings of the work includean inverseproportionality relationship between detection and container thickness. Steel containers were found to attenuate detection the most while wooden containers were the least affected by a unit increase in thickness. All materials studied were seen to attenuate detection by more than 70% at 0.5 cm thickness.

37. DETERMINATION OF HEAVY METALS IN BREAD BAKED IN GOMBE METROPOLIS, USING ATOMIC ABSORPTION SPECTROMETERY TECHNIQUE

BY

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ABSTRACT
Concentrations of heavy metals were determined in some bread samples obtained from some bakeries within Gombe metropolis. The bread samples were digested using nitric (HNO_3)and hydrochloric (HCI) acid in the ratio of 3:1 and analyzed with the help of Atomic Absorption Spectrometer (AAS) to determine heavy metals. The mean concentration for each heavy metal in the analyzed sample was calculated. Concentrations were compared with the permissible

levels set by WHO.Results showed that the levels of Copper, Magnesium, and Manganese in the bread samples are 0.075±0.295µg/g, 22.70±4.130µg/g and 63.42±10.606µg/g respectively, but lead was not detected in any of the samples. When compared with standards (WHO), heavy metal concentration levels were found to be within safe limit. Onlymagnesium concentration (22.7µg/g) was greater than the WHO value (20µg/g).

KEYWORDS: Atomic Absorption Spectrometry(AAS), Bread, Heavy metals, Gombe Metropolis.

38. APPLICATIONS OF RESONANCE INTEGRAL VALUES IN EPITHERMAL NEUTRON ACTIVATION ANALYSIS OF SHORT LIVED RADIONUCLIDES

BY

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ABSTRACT

An Epithermal Neutron Activation Analysis (ENAA) method using cadmium as shielding material was used for determination of thermal and epithermal fluxes. The thermal flux value of 2.60x10^{11} n/cm^{2}was determined against an epithermal value of 5.03x10^9 n/cm.^{2} The $I_0(\alpha)$ values representing the non ideal values of resonance integral of Iodine(88.82), Bromine(43.12) along with the interfering elements such as Chlorine(0.25), Potassium(1.20), Manganese(12.15) and Sodium (0.27) were determined. Advantage factors fordetermination of Iodine (28.1) and Bromine (16.44),have been evaluated, by determining cadmium ratios of Iodine (2.95) and Bromine (5.04), along with those of the interfering elements like Cl(72.04), K(50.79), Mn(57.8) and Na(82.86). Iodine and bromine showed better improvement in sensitivity with values of 3.08 and 1.81 respectively. The obtained results showed that ENAA can be a good method for determination of iodine and bromine. Linear relationships were obtained between the atomic numbers of the above elements and the values of resonance integral,$Q_0(\alpha)$, advantage and improvement factors. Good relationship was obtained between the paired data as shown by the high squared coefficient of correlation in the range of 0.944 to 0.967

KEYWORDS: Epithermal Neutron Activation Analysis (ENAA), Resonance integral, thermal and epithermal fluxes, cadmium ratio, advantage factor and improvement factor.

39. EFFECTS OF METAL BACK CONTACTS ON THE EFFICIENCIES OF CdS/CdTe THIN FILM SOLAR CELLS

BY

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ABSTRACT

Device simulation is used to investigate the effects of metal back contacts on the performance of CdS/CdTe thin film solar cells at different working temperatures. The simulations were done for chemical and physical based deposition techniques. The working temperatures studied ranges from 300 to 600K for Copper, Cobalt and Platinum back contacts using standard SCAPS 3.3.03 version software. Thin film solar cells with Platinum back contact of work function of 5.6eV exhibited better efficiency 17.24% at working temperature 350K with chemical method and 18.54% at 300K for physical method. Cobalt with metal work function of 5.0eV had 5.66% efficiency at working temperature 400K with chemical method and 6.58% at working temperature 300K for physical method. Copper with work function of 4.7eV showed the least efficiencies of 0.81 and 0.73% for chemical and physical method respectively at the same working temperature of 300K. The right metal work function should be selected as back contact electrode and using back contact buffer is encouraged to enhance the efficiency.

VALIDATION AND COMPARATIVE STUDY OF MEASURED AND PREDICTED PATHLOSS OF SOME GSM NETWORKSIN SUB-URBAN AREA

BY

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ABSTRACT

This research work presents gsm pathloss through Kwara State Polytechnic permanent site, Ilorin. The study area is between latitudes $08^0\ 32^1\ 37.6^{11}$ and $08^0\ 34^1\ 27.9^{11}$, longitudes $04^0\ 38^1\ 07.7^{11}$and $04^0\ 38^1\ 17.3^{11}$. The elevations of the two reference points were 350 and 364 meters respectively. The signal strength of MTN, GLO, AIRTEL and ETISALAT networks were measured with TECNO D3 Android mobile receiver from Base Transceiver Station (BTS) at intervals of 100 meters. The linear distance covered from the array of cell site was 3,100 meters. The signal strength data obtained were used with appropriate equation to determine the pathloss in the study area. The pathlosses obtained werecompared with the pathloss computed from COST-231 HATA and LEAST SQAURE MODELS for suburban area where the measurements were taken. The results proved that the predicted and the measured pathloss were intertwine and close to each other and the values obtained shows that the people living around the study area are suffering from poor gsm communication system. This paper is recommended for radio engineers and gsm telecommunication companies for effective planning.

KEYWORDS: gsm, pathloss, COST-231 HATA, LEAST SQUARE MODELS

40. Decomposition (SVD) Method of a Complex Symmetric Matrix

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Abstract

The 2 x 2 complex mass matrix describes the mixing of the charged Gauginos and charged Higgsinos. Using the SVD method, the chargino masses are:

$$M^2_{x1,x2} = \frac{1}{2}\left[|\mu|^2 + |M_2|^2 + 2M_w^2 \mp \left[|\mu|^2 + |M_2|^2 + 2M_w^2\right]^2 - 4|\mu|^2|M_2|^2 - 4M_w^4 \, Sin\,\beta + 8M_w^2 \, Sin 2\beta \, \mathrm{Re}(\mu M_2)\right]^{1/2}\right]$$

where μ is the Higgsino mass parameter M_2 is the gaugino majorana mass $\beta = V_u/V_d, V_d \; and \; V_u$ are the two Higgs vacuum expectation values. M_w is the mass of the w gauge boson.

Performance Parameters Evaluation of Amorphous Photovoltaic Modules in a Semi-Arid Climate Conditions: the case of Ekiadolor Community, Nigeria.

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Abstract:

The effects of temperature and radiation intensity on the performance parameters of amorphous silicon (a–Si) photovoltaic module have been investigated. An outdoor experimental setup was installed to carry out a series of I–VII parameter measurements under different irradiance and temperature conditions of the module. The module parameters extracted from I–VII measurements were employed to calculate the module performance parameters, i.e. open circuit voltage $V_{oc,}$ Maximum power P_{max}, fill factor FF and Module efficiency η at different temperature range and irradiation intensity. Results obtained indicate that the module parameters have significant effect on module

performance. Also, the behaviour of V_{oe}, I_{sc} and $P_{max}$are completely different at higher irradiance and temperature.

Keywords: Amorphous, irradiance, fill factor, photovoltaic, efficiency.

41. GEOELECTRICAL TOMOGRAPHIC EVALUATION OF SUBSURFACE CONDITIONS OF DUTSE MODEL INT'L SCHOOL AND ITS ENVIRONS, JIGAWA STATE, NIGERIA

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ABSTRACT

The study gives an overview on the utility of two dimensional direct current resistivity methods to explore the subsurface condition of Dutse Model International School and its Environs. Four parallel profiles each of length 200m and separated 120m apart were established.Currents and corresponding voltages were collected for the various investigating points with electrode spacing ranging from 5 to 60m. The collected data was reduced to resistivity values and then arranged in Notepad in a format acceptable to the software used in generating the resistivity sections for each profile. The resistivity sections were transformed into geologic section based on the geology, borehole data of the area and standard resistivity values of earth materials. The resistivity as well as the geologic section was used to draw inferences with regards to stratification and its groundwater potentials of the area. The study identified that the second profile with end point latitude 11°45´46.33´´N to 11°45´42.09´´N and longitude 9°23´50.66´´E to 9°23´55.62´´E has the best fractured basement coverage layer and favorable resistivity value of 600Ωm to 900Ωm. Consequently, the profile was recommended for groundwater exploration activity and was selected to provide a sustainable yield to even motorable borehole. The recommended depth of exploration for groundwater exploration was from 60m to 70m.

Key word: Stratification, Groundwater, Fractured Basement

42. DEVELOPMENT OF SALTWATER INTRUSION MODEL IN COASTAL

AQUIFERS

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ABSTRACT

Saltwater intrusion is a major challenge for the management of drinking water supply in the coastal regions. It is the most common and wide spread contamination problem in aquifers around the world due to increasing coastal population. The best means to understand, predict, and ameliorate saltwater intrusion, as well as to manage aquifers subject to saltwater intrusion involves mathematical modeling to simulate the effect of hydrogeophysical parameters on the mass flux of saltwater on coastal aquifers. A mathematical model was developed by applying some constraints on Darcy's and Fick's laws; it was used to simulate effect of geophysical parameters on mass flux of saltwater in coastal regions. The range of boundary value conditions were obtained empirically from a modeled experiment. Results showed that the mass flux of saltwater contaminant in a porous medium attenuates as a function of hydraulic conductivity and diffusion coefficient.

Key words: Seawater intrusion, groundwater, hydraulic gradient, hydraulic conductivity and diffusion coefficient.

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43. Determination of Moho depth and Vp/Vs ratio in Nigeria from a Local Earthquake

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Abstract

The depth of discontinuity between the crust and upper mantle (Moho depth) as well as ratio of the Compressional to Shear wave velocities (Vp/Vs) in Nigeria, have been determined using the Primary (P) and Secondary (S) elastic waves from the 2009 earthquake in Nigeria. The methodology involves the modeling of the earthquake recorded by the Nigerian Seismic

Stations located in Ife, Kaduna and Nsukka respectively, using a Pyrocko algorithm that implements wave propagation within 1500km fringe of the epicenter to the receiver, as a function of ray parameters; adopting a Global Earth Velocity model. The results showed that the moho depths beneath Ife, Kaduna, and Nsukka stations were respectively 39km, 38km, and 28km. The computed Vp and Vs for the depth profile (100-300km) in the Southwestern Nigeria, increased from 5.83-6.42 and 3.48-6.31km/secs respectively; with Vp/Vs decreasing from 1.68 to 1.67 within the same depths. The aim of this work therefore, is to determine the crustal structure of Nigeria (moho depth and velocities) in order to improve on the mechanics of earthquakes location, as well as to aid future seismic hazard and microzonation studies for proper planning and development in the Nigeria.

Keywords: Nigerian Seismic Stations, the 2009 earthquake, crustal structure, Vp/Vs ratio

44. Reservoir Characterisation and Rock Volume Estimation Using 3D Seismic and Petrophysical Data in Bada Field, Niger-Delta Basin, Nigeria

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Abstract

Reservoir characterisation and estimation of reservoir rock volume was carried out in Bada Field, Niger-Delta basin of Nigeria using 3D seismic and composite well logs data.

Petrophysical parameters were determined from well log analysis and seismic-to-well tie was used to identify the reservoir sands picked along the well on the seismic section. Hydrocarbon-water contacts were identified and the net pay was determined from well logs. Signal attributes- maximum amplitude maps and time slices of the envelope attribute from the seismic sections were used to examine the spatial distribution of hydrocarbons within a reservoir sand. The generated time and depth maps showed two major faults (growth faults) and other antithetic faults present in the field. Fourclosures or traps P1, P2, P3 and P4 were identified on each of the sands picked while wells situated in a closure were used for petrophysical analysis to minimize estimation errors. Reservoir sands were found to range from 2000 to 2625 m/s (6561.68 – 88612.20 ft/s). The porosity of reservoir sands, which ranged from 26 to 28%, was good to very good and their permeability, with average field range from 1328 to 2770.5 mD, was excellent. The average hydrocarbon saturation range from 22.90 to 53.87%, with corresponding water saturation ranging from 34.0 to 77.11%. The reservoir rock volume was substantial- 496.9 and 2068.5 acre-ft for the P3 closure in Sands C and D respectively and can be exploited at profit.

Keywords: Envelope attribute, Closure, Characterisation, Niger-Delta, Nigeria

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45. WEB BASED NEURAL NETWORK SYSTEM FOR THE EARLY DETECTION OF DEMENTIA

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ABSTRACT

Expert systems are suitable for knowledge-intensive problems that are typically solved by human experts. One of such problems is dementia in the world, over 47.5 million people have dementia and there are 7.7 million new cases every year. This research work is focused on the development of a web based neural network system for the detection of various forms of dementia in order to solve the problem of getting access to diagnosis over public access platforms as this leads to late detection and unproductive successive medical care. Solving this problem involved the use of Matlab for training a Multi-layer perception artificial neural network using Levenberg-

Marquardt algorithm with existing data sets from doctors in the field of medicine and implementing the trained network using fast artificial neural network (FANN) component in Php (Version 5), a server side scripting language. The system thus developed is accessible over the public internet by care givers and patients worldwide.

Keywords: Neural Network, Dementia, Web Based

46. INTELLIGENT TUTORING SYSTEM (I.T.S) AS A TOOL IN ENHANCING STUDENTS PERFORMANCES IN MATHEMATICS

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ABSTRACT

The evaluation of intelligent tutoring system (I.T.S) is an important though very often neglected stage of ITS development. This research focuses on the implementation of an intelligent tutoring system for mathematics at secondary schools which can enhance the performance of students in mathematical sciences. In order to enhance the performance of mathematics skills in secondary school, this tutoring system can be used to tutor students at their leisure time in addition to classwork. Information will be readily available on the system for students to access and learn, using mobile devices or computers. Users of this system can take lessons and also test their level of comprehension at the end of every test. The advantages of the intelligent tutoring systems are: consistent tutoring technique, modeling of good practice, scaffolding, immediate feedback, recommendation, and motivation.

Keywords: ITS, Implementation, Mathematics, Performance.

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47. Comparative Analysis of HighBlood Pressurein Adult Male andFemale: An Adaptive Prediction Model and Frequency Approach

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Abstract

This study investigates the prevalence of high blood pressure in adult male and female, frequency of daily attendance and prediction of after diagnosis attendancefor the period of five

years within a local community in Delta State. The summary statistics, prediction model and frequency approach was applied to investigate the aforementioned concepts. The analysis revealed that for the period understudy, the adult femaleismore hypertensive than the adult male.Although, the frequency procedure showed that females have higher daily attendance to medical checkup than males. Further analysis showed that during pregnancy, stress, economic and unsatisfactory social standard of living, female blood pressure tends to increase whereas for the male, stress, economic and unsatisfactory social standard of living are attributed to high blood pressure among other factors. The investigation further indicates that when the aforementioned factors are properly managed, the risk attributed to this ailment tends to decline though gender dependent. The analysis showed that the prevalence of high blood pressure is increasing.

Keywords: Blood pressure; High blood pressure; Mean; Frequency; Prediction

48.EMPIRICAL COMPARISON OF THE RUNTIME OF SORTING ALGORITHMS

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ABSTRACT

Sorting is one of the important operation computers perform on data. The study of sorting algorithms is relevant in the field of Computer Science because of the amount of time most computers spend on this process. Sorting algorithm is used by almost every application as an intermediate step to other processes, such as searching.The basic process of sorting is the same as taking a list of items, and producing a permutation of the same list arranged in some specific order. However, there are varying methods or algorithms which can be used to achieve this. Amongst them are bubble sort, selection sort, insertion sort, Quicksort and merge sort. The purpose of this investigation is to determine which of the above sorting algorithm(s) is fastest to sort one dimensional randomlist of sequential integers, upon the bases of average case complexity.Although theoretical comparison of the algorithms is touched upon, the main type of comparison discussed is an empirical assessment based on running each algorithm against varying data size. Thus,C#program was implementedto perform the practicalities and a conclusion can be brought on what algorithm to use in each particular occasion.

Keywords

Sorting, Selection Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort, Runtime, Stop Watch.

49.On the Comparative Study of Initial Basic Feasible Solution Methods forTransportation Problem using Temporary Ordered Routing Algorithmas a Validation Tool

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ABSTRACT

This paper presents a comparative study of Initial Feasible Solution Methods for Transportation Problem using Temporary Ordered Routing Algorithm (TORA) as a Validation Tool. To achieve this, various methods of finding initial feasible solutions including Northwest Corner Method, Least Cost Method, and Vogel Approximation Method were considered. These methods were compared on a balanced transportation model to provide the basis of finding initial solutions. A comparison of results (Initial feasible solutions& Optimal solutions) obtained from these various methods were presentedalong with the number of iterations required for the solutions. Findings from the results of several runs of the tested problem reveal that,the North West Corner Method, although fast in obtaining initial solutions (and theoretically very simply to implement), is not very efficient and accurate enough in finding the initial feasible solutions of this type of transportation problem. Also, the objective value for the transportation cost of the initial basic feasible solutions obtained through the Least Cost Method and Vogel's Approximation Method were in good agreement with the optimal solution or exactness. Thus, Vogel Approximation Method, (being an improved of Least Cost Method) is effective for the solution of this type of problem.

Key words: Transportation problem, Linear Programming, Northwest Corner Method, Least Cost Method, Vogel's Approximation Method , Optimal Solution.

50. TRANSIENT ANALYSIS OF THREE-PHASE INDUCTION MACHINE USING DIFFERENT REFERENCE FRAMES

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Abstract:
Three-phase induction machines are generally used as motors for many industrial applications and all this is due to its simple construction and other advantages in contrast to other machines. Popularity of these motors has resulted into a lot of research including the transient behaviour of the machine. Literature survey reveals that most of the researchers adopted only a single reference frame to estimate transient behaviour of the machine. In this work qd axis based modeling is proposed to analyze the transient performance of three-phase squirrel cage induction motor using stationary reference frame, rotor reference frame and synchronously rotating reference frame. Simulated results have been presented to buttress the functionality of these induction motor with the aid of MATLAB/SIMULINK.

Keywords: modeling, induction motor, reference frames, simulation, transient analysis.

51. Analysis of Continuous Cassava Peeling Machine Design for Domestic and Commercial Use in Nigeria

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Abstract

Analysis of Cassava peeling machine designed for domestic and commercial use in Nigeria was carried out. The cassava peeling machine was evaluated to determine its performance,machine through capacity, peeling efficiency, percentage of flesh loss, percentage of peels removed by machine and manually. The results obtained indicate that a peeling efficiency of 91.3%, average peeling time of 11.24minutes and 1.62minutes were calculated for manual peeling and machine peeling respectively. The percentage of mass of peels removed manually and by machine were approximately the same (9%). A machine through put capacity of 0.147kg/sec was obtained. The analysis of flesh lost shown that 0.6565% of useful cassava flesh was lost.Considering the results obtained, the machine can be used for domestic and commercial purpose in Nigeria.

Keywords: Cassava peeling machine, analysis, efficiency, machine through put capacity, Nigeria

52. THE USE OF MULTI-CRITERIA DECISION MAKING ANALYSIS FOR THE SELECTION OF SUITABLE WATER SUPPLY SOURCE FOR EKOSODIN COMMUNITY IN BENIN CITY.

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ABSTRACT: The decision to provide water supply to a community requires the consideration of several criteria and alternatives sources of water supply. This is in view of the sensitive nature of water supply scheme and the irreversibility of the project. For the determination of the most suitable water supply source for Ekosodin community, cost, availability, accessibility, infrastructural requirements and health impact of the water to be supplied were selected as controlling criteria while the sources selected include rainwater, borehole, stream and water tanker supply. AHP and TOPSIS which are two multi-criteria analysis methods were used with structured questionnaires to determine the most preferred criterion for selecting the right source of water. Results of analysis showed that health impact with a normalized relative of 47.18% and Positive Ideal value of 7.07 for the AHP and TOPSIS methods respectively was the most preferred criteria. Borehole water source with a composite weight of 41.28% and a relative closeness of 0.75 in the AHP and the TOPSIS came top as the most suitable water source for the study location.

Keywords: Criteria, Water Sources, AHP, TOPSIS, Health Impact and borehole.

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53. Analytical Solution of the Effect of Suction/Injection on Transient Natural Convection Micro-Gas Flow between two Vertical Parallel Plates: A Time-Periodic Regime

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Abstract:*This paper analyzed the hydrodynamic and thermal behavior of an unsteady fully developed natural convection flow, in a vertical parallel micro-porous-channel (whose boundaries are heated sinosoidally), in the presence of suction/injection, with velocity slip and thermal jump at the walls.The exact solutions of the momentum and energy equations as well as the expressions for skin friction and thermal flux at the walls are obtained. The variation of temperature and velocity with respect to frequency of the driving force, Knudsen number, suction/injection parameter, combined values of frequency of wall's temperature oscillation and time* $(\omega\tau)$*, and that of skin friction and heat flux with respect to suction/injection parameter and* $\omega\tau$*are discussed.Numerical values of skin friction, heat flux, temperature and velocity are computed. It is found that injection acceleratesand suction retards the flow.*

Keywords: Suction/Injection, sinusoidal temperature, frequency of the driving force, Knudsen number

54. Tsallis q-Statistics variations in TEC for quiet and disturbed days of January 2011 for the ionosphere over Enugu and BirninKebbi Nigeria.

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Abstract

The Tsallis non extensive statistical mechanics has been very useful in the study of complexity in different natural systems. In this work the analysis of the Tsallis$q$-statistics variations was carried out for total electron content (TEC) data obtained from two different Global Positioning System (GPS) receiver stations and at different seasons. The Tsallis$q$-statistics evaluation has been carried out on detrended TEC data for two selected station which areBirninKebbi ($12°32', N4°12'E$ and $14.19°N$ Dip latitude) and Enugu ($6°26'N, 7°30'$and $8°N$ Dip Latittude) The observation of the type of probability distribution, shows that the ionospheric system displays a special type of probability Gaussian distribution known as q-Gaussian. The output is fit into a general q-Gaussian expression to obtain the Tsallis$q$-index. An assessment of $q$variation for different TEC time series, have been carried out to see the difference in variations of Tsallis q values and to see the possible reasons for the variations. The observed values of q appears to vary by smaller margins within similar geophysical conditions. This may be due to variations in the statistical mechanics of the ionospheric system at different conditions.

55. X-Ray Diffraction-Analytical Studies of Nanocrystalline Cobalt Oxide Thin Films via Solution Growth Technique.

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Abstract

Sail brand microscope glass slides Cat. No. 7102 were used in growing thin films of cobalt oxide [CoO] by using the solution growth technique, at 300K. X-ray diffraction was used to determine the structural properties of the film samples. Two samples of CoO thin films annealed at 373K and 573K, respectively were investigated. The particle size D[nm] and inter-planar spacing d[Å] of the film samples were calculated from Debye-Scherrer formula and Bragg's formula respectively, while the thickness t[nm] was determined from peak indexing. Both the thickness and d-spacing of CoO thin films decreased with the increase in annealing temperature. In contrast, the particle size of the thin film samples studied increased with the increase in annealing temperature. The ranges in the particle sizes determined are 18-23nm and 19-25nm for the samples annealed at 373K and 573K respectively.

Key words: Cobalt Oxide, X-Ray diffraction, Chemical Bath Deposition

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56. Paschen's Breakdown Voltage in Air and Pure Gases

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Keywords: Breakdown Voltage, Paschen's law, electrode spacing, pressure

Abstract: This work is devoted to a numerical and analytical calculation of breakdown voltage in electrical discharge of Air, Argon, Carbondioxide, Helium, Hydrogen, Krypton, Neon, Nitrogen and Xenon. It was performed using MATLAB which was based on the numerical solutions of the two moments of Boltzmann equation coupled with Poisson's equation to calculate the breakdown voltage according to the product of the electrode spacing and pressure (*pd*). The electrode spacing of 2.5, 5.0 and 7.0cm were used. Paschen's curves were generated in these spacing which have a strong agreement with the empirical values. The minimum breakdown voltage for Air, Argon, CO_2, He, H_2, Kr, Ne, N_2 and Xe are respectively 222.2, 101.5, 327.7, 130.0, 225.2, 181.1, 203.1, 215.6 and 111.6 Volts.

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57. Analytical Solution of Risk Adjusted Option Pricing Model By Variational Iteration method

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Abstract:The work presents analytical solution of a non-linear Black Scholes-equation (Option Pricing Model) with transaction cost measure and volatile portfolio risk measure. The analytical solution was obtained by using variational iteration method.In this method the problems are initially approximated with possible unknowns, and then a correction functional is constructed by a general Lagrange multiplier which can be identified optimally via the variational theory.Under some given conditions, we obtain similar solution as for the linear counterpart found in literature.

Keywords:Black-Scholes equation,Variational Iteration method, Lagrange multiplier

58. Linearization of a Model Equation for Structural Vibration Problems using Differential Forms

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Abstract

In this paper, the linearizing point transformation for themodel equation of structural vibration problems using the method of differential forms is obtained.

Key Words: *Point transformation, Differential forms, Linearization, Model equation, Structural Vibration Problems, Second order ordinary differential equations.*