SMAT2008V01

A STUDY ON THE DYNAMICS OF AN OVERSIZE AND OVERWEIGHT VEHICLE COMBINATION

Gabriel ANGHELACHE, Raluca MOISESCU, Florian ARON

Abstract: *The current paper intends to analyse the transport capacity of road vehicle combinations involved in transport of oversize and overweight equipment on an inclined road. Computations regarding the balance of traction forces and adherence limitations have been performed. The solution of traction using three tractor vehicles with appropriate ballast ensures the achievement of objectives.*

Keywords: *oversize and overweight transport, heavy tractor vehicle, traction force, adherence, ballast.*

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SMAT2008V02

APPROXIMATE METHOD IN ORDER TO DETERMINE THE DISPLACEMENT FIELDS FOR THE KINEMATIC ELEMENTS STANDING IN VIBRATION

Băgnaru D. Gh. [1], Stănescu M. M. [2], Bolcu D. [1], Cuță P. [1]

Abstract. *First of all, using the mechanical model with four concentrated masses, the mathematical model of vibrations in case of a linear-elastic connecting rod, part of a parallelogram mechanism, is presented. Afterwards, the cross displacement field is determined. For a concrete case, the diagrams of cross displacement in relation with time and with distribution of points are given. The knowledge of displacement fields as a result of the vibrations for the kinematic elements is a preceding stage for the determination of the stress and strain states, useful in machines designing.*

Keywords: *kinematic elements, displacement fields, vibrations, mathematical model.*

SMAT2008V03

THE POWER WEIGHT OF THE VIBRATION MODES OF AUTOMOBILES WITH RANDOM EXCITATION BY BEARING RACE

Monica BÂLDEA, Marina PANDREA, Nicolae PANDREA

Abstract: *In case of the pattern with several freedom degrees of the automobile where the excitation by bearing race is random it moves to main coordinates, the spectral densities of power for every main coordinate is determined and then with the help of the efficient values the power weights for every vibration source is determined.*

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SMAT2008V04

EXPERIMENTAL RESEARCH ABOUT DYNAMICS BEHAVIOUR OF LANDING GEAR

Mihaela BOGDAN, Dragoş POPA, George GHERGHINA, Loreta SIMNICEANU

Abstract: *The paper presents experimental investigation equipment for testing of scale model principal landing gear. It is made a special soft for data acquisition of the measured parameters. Also, it is elaborated another soft for experimental data processing for the obtaining diagrams of variation for many parameters which describe the dynamical behavior of the landing gear. The values of the reference parameters can be determined in various function conditions. It can estimate the life time for different elements from landing gear structure.* ***Keywords****: experimental investigation equipment, testing, landing gear.*

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SMAT2008V05

ASSESSMENT OF VEHICLE MOBILITY USING NRMM

Ticusor CIOBOTARU, Valentin VINTURIS, Lucian GRIGORE

Abstract: *The paper presents in its first part the general structure of the software NRMM (NATO Reference Mobility Modelling). Some new concepts such as Cone Index (CI) and Vehicular Cone Index (VCI) are introduced. The second part is devoted to the presentation of various simulations of running vehicles on soft soils in order to asses the mobility.* ***Keywords:*** *mobility, soft soil, cone penetrometer.*

SMAT2008V06

METHOD FOR MEASURING TIRE DEFLECTION

Ticusor CIOBOTARU, Valentin VINTURIS, Valentin IONASCU

Abstract: *The paper presents the manner in which an ultrasonic sensor is used in order to measure the deflection of tire during the running. The paper details the hardware used as well as the results obtained using this method.* ***Keywords:*** *tire, deflection, ultrasonic sensor.*

SMAT2008V07

STUDY OF INSTRUMENTATION SETTLING TIME

Mihai CLINCIU, Vasile CAMPIAN, Nicolae TANE
Diana C. THIERHEIMER, Walter W. THIERHEIMER

Abstract: *This paper analyses the influence of instrumentation amplifier settling time induced by the data inaccurate. The instrumentation amplifier applies a specified amount of gain to an input signal, which raises the signal to a higher level and ensures proper A/D conversion.* ***Keywords:*** *Control, kinematics, instrumentation.*

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SMAT2008V08

SOME CONSIDERATION ABOUT THE OPTIMISATION OF STEERING MECHANISM WITH SUSPENSION

Mihai CLINCIU, Vasile CAMPIAN, Nicolae TANE
Diana C. THIERHEIMER, Walter W. THIERHEIMER

Abstract: *In this particular case we considered the elements that have big influence in dynamic behavior of the automotive, such as: steering geometry, the particular aspects regarding constructive solution.* ***Keywords:*** *Control, kinematics, suspension.*

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SMAT2008V09

STUDY ON THE LIFETIME OF METALIC HELICAL SPRINGS USED FOR THE SUSPENSIONS OF ROAD AND RAILWAY VEHICLES

Ion Copaci [1] ,**Aurelia Tănăsoiu**[2]

The paper presents an experimental study on the metalic elastic element, helical spring with bar diameter of 24,4 mm, under fatigue testing, for the purpose of establishing its lifetime and consequently its reliability.

The load collective that was adopted and the number of cycles pertain to the conditions imposed by international norms.

We have presented the Wohler load and fatigue resistance curves contained in UIC report ERRI B12 Rp60.

Thus we have determined theoretically and experimentally, the lifetime as a component of the reliability of the studied metalic elastic elements, with the corresponding conclusions.

Keywords: fatigue resistance, lifetime, Wohler curves.

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SMAT2008V10

CAD-PLM INTEGRATION USING THE WEBDAV PROTOCOL

Dinu COVACIU, Ion PREDA, Vasile CÂMPIAN, Ovidiu-Vasile CÂMPIAN

Abstract: *Product Lifecycle Management or PLM is a term used for managing the entire product lifecycle, from its conception, through design and manufacture to service and disposal/recycling. A mechanical CAD and PLM integration enables the PLM system to manage CAD design objects (assemblies, parts, drawings, etc.), to control the access to them, to track changes and to maintain the appropriate relationships between the CAD objects and the PLM's product structure. WebDAV is a protocol dedicated to versioning and authoring, a set of extensions to the HTTP protocol which allows users to collaboratively edit and manage files on remote web servers. This paper presents a CAD-PLM integration method using this protocol, and a tool developed based on this method.*

Keywords: *PLM, CAD, WebDAV, DASL, versioning.*

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SMAT2008V11

INFLUENCE OF INTERNAL TIRE PRESSURE ON THE RADIUS OF TURN AT FRONT DRIVE AXLE MOTOR CARS

Dan S.C. DĂSCĂLESCU, Radu DROSESCU, Adrian SACHELARIE, Radu MĂNUCĂ, Mihai SAVISCHI

Abstract: *In the paperk are presented accomplished tests in cornering on a front axle drive car at different internal pressure of tires. The yaw angle, radius of turn, angular velocity, heading angle, lateral acceleration and velocity have been measured with an VBox apparatus coordinate in GPS by satellites. By analyze of experimental results that modification of internal tire pressure, has as effect the lateral acceleration and radius of turn variations .****Keywords:*** *cornering, lateral acceleration, radius of turn, internal tire pressure.*

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SMAT2008V12

MEASUREMENT OF FORCES INSIDE THE CONTACT SPOT OF THE TRUCK TYRE WITH THE ROAD WITH THE HELP OF THE SOLID FORCE TRANSDUCER

DRAGOMIR C.; ANGHELACHE G.C. ; LAZANU F, ZUS R.

Lucrarea prezintă cercetările privind eforturile din pata de contact a pneului de autovehicul autocamion cu drumul în regimurile caracteristice, accelerație, tracțiune şi rulare liberă. De asemenea se prezintă realizarea unui traductor de forță special proiectat pentru măsurarea pe trei direcții X, Y, şi Z, ce definesc spațiul. Acest traductor face posibilă afişarea curbelor forțelor ce acționează asupra fiecărui traductor ce se află montat în drum, în timp real. Cu ajutorul traductorului este posibilă măsurarea punctuală a forțelor din pata de contact a pneului cu calea de rulare pe toată lățimea petei de contact.

This paper deals with the research regarding the stresses inside the contact spot of the auto-vehicle – truck tyre with the road in the characteristic modes (free run) acceleration, haulage and braking. It also deals with construction of a force transducer purposely designed for measurements in three directions X, Y and Z that define space.

This transducer allows for displaying the curves of the forces acting upon each transducer mounted along the road, in real time. With the help of the transducer it is possible to punctually measure the forces inside the contact spot of the tyre with the rolling track on the contact spot whole width.

Key words: contact spot, tyre, solid force transducer, force-pressure, axle load, road.

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SMAT2008V13

THE INFLUENCE OF THE PC DATA ACQUISITION SYSTEMS ON THE SIGNAL ANALIZED

Vasile Valerian COJOCARU, Vasile CAMPIAN, Nicolae TANE
Diana C. THIERHEIMER, Walter W. THIERHEIMER

Abstract: *This note explains the basic operation and theory of aliasing, antialiasing and digital filters. The overall purpose of digitising DAQ systems is to get an accurate representation of a real-world signal derived from sensors or transducers. The importance of digital filters is well established. Digital filters, and more generally digital signal processing algorithms, are classified as discrete-time systems.* ***Keywords:*** *DAQ board, instrumentation amplifier, sampling rates, settling time*

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SMAT2008V14

AUTOMOTIVE DEPORTANTE WING WITH COANDĂ EFFECT

Angel HUMINIC, Gabriela HUMINIC

Abstract: *The aim of this study is to investigate the effect of ground proximity on the aerodynamic lift and drag of a deportante wing assisted by Coanda effect. Using a classical airfoil as example, namely the Clark-Y, the flow around this with both ground effect and Coanda effect was simulated with the aid of the ANSYS CFX, finite volume CFD code. The results show that Coanda effect can be used to reduce trailing edge separation, in order to optimize the aerodynamic characteristics of the wings. Practically applications are concerning the automotive aerodynamic devices as ailerons, used to generate downforce in order to increase the stability and handling of the vehicles.* ***Keywords:*** *automotive deportante wing, ground effect, Coanda effect, aerodynamic characteristics.*

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SMAT2008V15

GETTING A MATHEMATICAL MODEL OF THE VEHICLE'S DYNAMICS USING REGRESSIONS

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Abstract: *The classic approach in data analysis of measured mechanical amounts is mainly a deterministic one. Practically, because of the traffic and the road envelope, vehicle evolution on the roads is more like a stochastic one. That means that statistical tools should be used for designing the mathematical model of the vehicle's dynamics. This paper presents a method to determine the vehicle's dynamics using regressions. There were tested 11 cars (Daewoo Nubira) with different millages in different environments and traffic. The result was a number of 64 tests. Using them and simple and multiple linear regressions we determine new models of the vehicle's dynamics for this specific car (Daewoo Nubira). The modelling process could be used for any kind of parameter and vehicles.*
Keywords: *regression, vehicle, dynamic, linear, simple, multiple*

SMAT2008V16

ANALYTICAL RESEARCH OF MECHANICAL STRESSES IN A TRUCK STRENGTH STRUCTURE

Dan Ilincioiu, Catalina Ianasi, Claudiu Anghel

Abstract: *The strength structure of a transportation power-driven vehicle is a bars system that builds-up a complex frame, space loaded. Due to the multiple constraints and to the closed geometrical contours, the mechanical system is not only exterior but also interior redundant. In order to evaluate the value of mechanical stresses by analytical calculation, the indeterminedness must be solved. In this paper the mechanical indeterminedness calculation is made using the stresses method, only the transverse stress and the torque load will be taken into account.*

For a proper structure of the three axles trucks, the stresses distribution in the component bars will be determined. Thus, the determined calculation will make the basis of an automatic running program that allows the deceleration of different influences of the geometrical and loading parameters over the mechanical stresses. An application will be made on a particular structure using the constructive elements of a heavy transportation power-driven vehicle. ***Keywords:*** *material strength, mechanical strength, mechanical strength structure, truck.*

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SMAT2008V17

SOME DYNAMIC ASPECTS OF *NEMO, TRIO* AND *MIXTRA* - THREE PROTHOTYPES CREATED BY AUTOMOTIVE SPECIALISTS OF OVIDIUS UNIVERSITY OF CONSTANTA

Adriana-Teodora MANEA, Laurentiu –Claudiu MANEA, Gheorghe BOBESCU, George TOGĂNEL, Daniel TRUŞCĂ

Abstract: *The paper presents the dynamic behavior of three different prototypes realized as a team work together with students of Automotive section and specialists from other Universities. The experiments confirm the real dynamic behavior and the theoretical calculus thanks to the signals processed via some modern devices mounted in the cabs during experimental tests. A new polygon of experimental dynamic test was made in Constanta together with students.* ***Keywords:*** *Dynamic road tests, prototypes.*

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SMAT2008V18

ROAD DYNAMIC EXPERIMENTAL RESULTS OF MIXTRA'S COMPLEX EQUIPMENT

Laurentiu –Claudiu MANEA, Mihail PRICOP, Adriana-Teodora MANEA, Gheorghe-Alexandru RADU, Dragos DIMA

Abstract: *Managing emergency situations due to inundations, dangerous meteorological phenomena, accidents at hydro-technical constructions, accidental pollution and firefighting interventions, are a national interest activities regarding the frequency and dimensions of its effects This paper presents the road dynamics experimental results of the mixed swift intervention system MIXTRA which can be used at natural calamities, made of a specialized tractor vehicle and a multifunctional boat which can transport in the affected area one another, by land and by water. Due to a large specter of equipment and materials this system can be used in case of inundation for people, life stock and goods evacuation; first aid, fire fighting, aquatic ecological disasters, by day or by night and in areas accessible by water. Multifunctional boat has a mobile platform which is designed to offer access for the tractor vehicle in and out of the boat and also for the rescue of people, livestock and goods. The base solutions have a very large flexibility for different options and innovations.****Keywords***: *road dynamic experiments, multifunctional boats, emergency intervention, fire boat.*

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SMAT2008V19

SOME DESIGN ASPECTS OF *MIXTRA* – NAVAL AND ROAD COMPLEX SYSTEM

Laurentiu –Claudiu MANEA, Mihail PRICOP, Adriana-Teodora MANEA

Abstract: *In the national strategy for fighting emergency situations exists the possibility of improvement of the intervention gear by using a mixed road & naval transport system named. MIXTRA system by its inventors which is especially adapted to this purpose and also eliminates the disadvantages of existing mediums. The existing reality (emergency situations) and the identification of the actual intervention measures shows that the MIXTRA's solution is full af viability and represents an option in short term salvage.* ***Keywords:*** *rescue boat, fiber glass, multifunctional boats, emergency intervention, fire boat, mixed transportation (road and naval) transportation systems*

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SMAT2008 V20

ASPECTS CONCERNING DYNAMIC TESTING OF THE VEHICLES IN ORDER TO DETERMINE THEIR STABILITY LIMITS

Tiberiu MACARIE, Silviu IONIȚĂ, Helene ŞUSTER BĂDĂRĂU

Abstract: *Determining the stability limits of any vehicle, along with the consequences when these limits are exceeded, such as traffic accidents, becomes an extremely difficult issue during vehicle's design process or during its operation. Letting the driver know the moment when the vehicle loses its stability becomes essential for traffic safety. This work shows the way in which one can determine the stability limits of a vehicle when steering, with the help of the VBOX Mini unit.*

Keywords: *stability, skidding, sliding, overturning, electronic control.*

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SMAT2008V21

COMMUNICATION ANTENNAE FOR AUTOMOTIVES

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Abstract: *Among the special achievements during last years in the field of automotives we mention the development of telematics, navigation and communication systems. The implementation in automotive field of communication systems enabled the passengers to have extended services and applications with positive consequences in comfort improvement and road safety. The new systems work within a wide range of frequencies between 0.53 MHz and 77 GHz. This study, starting with the new communication services implemented to motor vehicles, analyses the development of necessary antennae, as well as their correlation to specific conditions of motor vehicle.*

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SMAT2008V22

STUDY CONCERNING FRACTIONAL FRONT AXLE KINEMATICS WITH TRANSVERSE FOUR NON-EQUAL RODS MECHANISM UTILISED FOR AUTOMOBILES WITH 3D MODELLING

Viorel MATEESCU, Liviu GEORGESCU, Mihai TICA

Abstract: Fractional axles with four non-equal rods mechanisms are widely utilised on cars. A factor for assessing the kinematics of these axles is the variation of the wheel-gauge and of the transverse angle of the pivot. Modifying of the kinematics is produced by changing positions of the joints and the length of the rods composing the mechanism, but these parameters must be related with the local and general layout of the car. In the paper is started form the existing car axle, which is modelled in 3D with the aid of the Autodesk Inventor program. Model is such designed that it can be modified the lengths of the rods, underlining for each variant modification of the wheel-gauge and of the transverse pivot angle when wheel is moving up and down. ***Keywords:*** *front axle, 3D modeling, wheel gauge variation, wheel angle variation, pivot transverse angle variation.*

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SMAT2008V23

CONSIDERATIONS ON DESIGNING MECHANICAL GEARBOXES FOR ALL TERRAIN AUTOMOBILES

Presenting Author Viorel MATEESCU, Liviu GEORGESCU, Dan Alexandru MICU

Abstract: Mechanical gearboxes are widely utilised on all terrain automobiles. They present a great importance in transmission efficiency and influence safety in exploitation and reliability for this category of automobiles. A main objective that must be aimed in the designing phase for improving efficiency and reliability is upgrading the rigidity of the gearbox shafts without increasing their diameters, respectively the gearbox gross weight. In the paper there are presented technical solutions for fulfilling this objective and their effects on the shafts deformations. ***Keywords****: gearbox, secondary shaft, intermediate shaft, deformations, rigidity, multi-bearings.*

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SMAT2008V24

THE DYNAMIC BEHAVIOR OF ROAD VEHICLE

Liviu MIHON, Daniel OSTOIA

Abstract: *The paper presents theoretical studies of a car dynamic behavior. Were annalyzed the working conditions starting from basic equations and related analyzing items, and taking in consideration different liniarization methods of this equation. The matehmatical model was realized in Matlab/Simulink.*

Keywords*: vehicle dynamics, indicial response,*

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SMAT2008V25

SINGLE-TRACK VEHICLES - A DYNAMIC APPROACH

Florin OLOERIU, Marin MARINESCU

Abstract: *A single-track vehicle is known either as bicycle or motorcycle. Although apparently simple, the dynamics of this kind of vehicle is rather complex. Many researches have been developed in this respect and the complex phenomenon is still under study. This paper attends in familiarizing the reader with the basics of this vehicle's dynamics and offers a good start in further research. Simple dynamical models have been developed and the most important forces and momentum have been taken into account. They haven't been yet compared with experimental results but these will be performed in the future, since our Dept. has an increasing interest in this respect. Best researchers in this field have been referred in the paper.* ***Keywords:*** *single-track vehicle, bicycle, motorcycle, balance, mathematical model.*

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SMAT2008V26

Consideration on the distribution of the vertical forces at the motor vehicle's in circular motion

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Abstract. *The number of unknowns is more numerous than the number of equations in the motion equations of a motor vehicle. For that reason to determine the distribution of the contact forces with the road there are necessary additional suppositions. One of these suppositions takes into account the neglect of the car body's strains. Under the circumstances it is considered that the vertical forces are proportional to the displacements on vertically of the suspension fixing points.*

Consequently there are determined the vertical forces at the four wheels.

There are presented the dependences of these ones depending on: the acceleration on the longitudinal direction, the speed and the angular acceleration of the motor vehicle, the mass and the additional weight and the distribution of this one by the coordinates compared to the theoretical centre of the road vehicle.

These are particularized the relations obtained for the passing over from the rectilinear motion to the circular motion, presenting the variations of the vertical forces depending on the angle between the speed of the mass centre and the longitudinal axis of the vehicle.

There are also determined the limit values of these forces taking into account that the motion of the mass centre is circular. Therefore it is observed a burden of the vehicle's exterior part, overloaded being the front wheel exterior to the bend. At the same time it is observed a discharged especially at the back wheel interior to the bend.

It is also determined the critical velocity at which the vertical reactions at the back interior wheel becomes null, so appearing the danger of the side slipping.

Keywords: *vertical forces, non steady motion*

SMAT2008V27

CONSIDERATIONS CONCERNING THE CALCULUS OF SUSPENSION INFERIOR'S ARM USING FINITE ELEMENT METHOD (FEM)

Catalin-Adrian NEACSU, Ionel VIERU, Gheorghe PETRACHE, Adrian-Ioan Niculescu

Abstract: *This paper presents the static results obtained for a suspension lower arm. The CAD model was done using CATIA V5 and the calculus using FEM by MSC/NASTRAN. The calculus was done considering the testing conditions imposed by the specification notes for product manufacturing.* **Keywords:** *lower arm, static calculus, FEM*

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SMAT2008V28

LED TECHNOLOGY IN THE AUTOMOTIVE INDUSTRY

Oana-Victoria OTAT, Alexandru-Mihai DIMA, Gabriel-Catalin MARINESCU

Abstract: *The use of LEDs for an increasing number of automotive lighting functions has developed the light engineering in the automotive industry in the past few years. This paper presents briefly the functioning of LEDs, the different designs for head and rear lamps for cars, the future projects for LED applicability and the reasons why LEDs take over the conventional bulb.*

Keywords: *light emitting diode(LED), lighting system, automotive.*

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SMAT2008V29

THE ANALYTICAL METHOD FOR THE DETERMINATION OF THE MECHANICAL ENERGY OF THE AUTOMOBILE VIBRATIONS WITH RANDOM EXCITATION BY BEARING RACE ON THE PATTERN WITH ONE DEGREE OF FREEDOM

Marina PANDREA, Monica BÂLDEA

Abstract: *For the pattern with one degree of freedom of the automobile's vibrations with random excitation by bearing race is determined by means of analytical methods the spectral density of power and power and the efficient value of the response and then the mechanical energy is calculated.*

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SMAT2008V30

THE MODAL POWER ASPECTS OF THE VIBRATIONS OF THE AUTOMOBILES WITH HARMONIC EXCITATIONS BY BEARING RACE

Nicolae PANDREA, Marina PANDREA, Monica BÂLDEA

Abstract: *Starting with the general expressions of the kinetic and potential energy in generalized coordinates the expression in main coordinates of the mechanical energy is deducted and then in an application is determined the power weight of the vibration patterns in the case of the automobile's vibrations with harmonic excitation by bearing race.*

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SMAT2008V31

POSSIBILITY OF TECHNICAL SYSTEMS SELFDIAGNOSIS

Florentin POPESCU, Vasile CAMPIAN, Nicolae TANE
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Abstract: *The paper addresses in a unitary manner issues regarding the diagnosis of technical products and systems. World- and nationwide the last period of time has been marked by intensive research on aspects related to diagnosis, in most cases taking into consideration concrete practical engineering situations, allowing the establishing of links with fields like artificial intelligence, expert systems, theory of decisions, computer science, theory of measurement, data acquisition technique, thus shaping a systemic approach to diagnosis. Diagnosis has emerged from the necessity of maintaining technical systems in a good operational state, research being driven by the achievement of hardware structures able to rapidly localise and isolate damage (incidents) and replace the affected areas by tolerant configurations, as well as by developing software capable of self-reconfiguration to an operational state at damage/failure parameters, without rendering the system inoperative.* ***Keywords:*** *data acquisition, artificial intelligence, diagnosis, expert systems*.

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STUDY ABOUT AUTOMOTIVE ROLLOVER DYNAMICS

Florentin POPESCU, Vasile CAMPIAN, Diana C. THIERHEIMER, Victor OTAT, Walter W. THIERHEIMER

Abstract: *The problem of kinematical, dynamical and mathematical models is considered to characterize the dynamical behaviour of vehicles on curvilinear movement. In this particular case were considered the elements that have a great influence on this dynamic behaviour of vehicles, as: geometry of guiding wheels, constructive and functional features particular to each front stabilization system of the vehicles, as well as the road micro profile that influence in particular the linear movement. The differential equation described in here was solved using the Laplace's method and the experimental works was carried out using a BMC acquisition system. The theoretical and experimental data comparison confirms with good accuracy the hypothesis made on the study of vehicle's stabilization system.*

Keywords: *BMC acquisition system, curvilinear movement, dynamical behaviour*

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SMAT2008V33

THE OPTIMIZATION OF THE MAINTENANCE ACTIVITY FOR THE DIRECTIONAL CONTROL SYSTEM OF THE MOTOR VEHICLE BASED ON THE RELIABILITY INDICATORS

Author: PhD student Eng. Horia Marcel SOTOC
Ovidiu Vasile Campian

Abstract: The efficiency and quality of the maintenance activity within the restoration process of the technical systems' function capacity depends mostly on assuring spare parts supplies and on planning as exact as possible the maintenance and repair works during the motor vehicles' operation period. In the essay is presented a method based on the application of the reliability indicators for the rational establishment of the spare parts supply to be replaced during the maintenance works that should guarantee both small costs, as well as minimum time for the immobilization of the vehicles during this process. The way to apply the proposed method is presented within the directional control system of a 5,8 tone lorry.

Keywords: optimization, maintenance, directional control system, utility car, lorry, reliability indicators, operational time.

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SMAT2008V34

THE INFLUENCE OF THE PRODUCTION AND EXPLOITATION FACTORS UPON THE RELIABILITY OF THE MOTOR VEHICLES' DIRECTIONAL CONTROL SYSTEM

Author: PhD student Eng. Horia Marcel SOTOC
Ovidiu Vasile Campian

Abstract: The insurance and the increase of the reliability of a technical system depends mostly on the detailed knowledge of all projection, production and exploitation factors' influence upon the technical state of a vehicle during the operation process. In the essay there are presented the causes that may determine the decrease of the reliability of a vehicles' directional control system and the technical and technological measures that can be taken to re-establish its safe operation.

Keywords: influence, reliability, lorry, utility car, directional control system, operational capacity, performance.

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SMAT2008V35

THE INFLUENCE OF THE VEHICLE'S TYPE AND OF THE EXPLOITING CONDITIONS UPON THE RELIABILITY OF THE STEERING GEAR

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Abstract: The paper analyses the influence of the vehicle's type and that of the exploiting conditions upon the reliability of the steering gear. In this certain sense it has developed a theoretical study proper through the description of the main causes that produce the degradation processes in the system's components. With the help of reliability indicators, the experimental research has established the importance of respecting the technologic discipline during the production process and the necessity of modernizing the roads, in order to eliminate extreme solicitation from the steering gear's elements.

Keywords: influence, reliability, steering gear, utility car, lorry, quantitative and qualitative indicators, operational time.

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SMAT2008V36

HYDROPLANING PHENOMENON'S EQUATIONS AT WHEEL TYRES HAVING THE ROLLER TRACK FROM CONTINUOUS LONGITUDINAL TAPES

Marinică STAN, Vasile HARA, Dinel POPA

Abstract: *In this paper is presented a study for the envelope's properties settlement regarding the phenomenon of hydroplaning. The phenomenon of hydroplaning is calculable with the motional equations of the viscid fluid in laminar regime for thin layers of fluid sub missed to crush. The determination of the calculus formula of the hydroplaning's critical velocity offers the possibility to compare the envelopes from this phenomenon's viewpoint, and through the introduction of the watery feather's evolution function from under the envelope at running on wet path is offered the possibility to express the adherence's diminution to bearer of the envelope depending on the wheel's running speed.*

Keywords: *envelope, hydroplaning, velocity, roller track, longitudinal tapes.*

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SMAT2008V37

COUPLED MULTIBODY – FINITE ELEMENT MODEL FOR THE STUDY OF AN OFF ROAD VEHICLE FRAME

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Abstract: *The paper presents computational methods applied to the study of an off road vehicle frame. The structure is firstly analyzed using finite element method. Internal energy consumed by the plastic hinges is determined and then the reaction torque and joint stiffness are computed. A multibody model is also developed and analyzed. The equation of motion and solving method are detailed and then applied for the structure model. Joint – plastic hinges data are exchanged between the numerical models and the results are compared. Optimization procedures can be defined for structural crashworthiness improvement.*

Keywords: *Vehicle frame, numerical models, finite element method, multibody method, numerical solution, plastic hinge characterization.*

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SMAT2008V38

DIMENSIONING OF THE HYDROSTATIC TRANSMISSION WITH PRIMARY ADJUSTMENT FOR A ROAD VEHICLE

Stelian TARULESCU, Victor BENCHE, Radu TARULESCU

Abstract: *The Diesel engines operating characteristics being less adjustable, is necessary a hydraulic coupling transformer that puts in concord the relative rigid momentum of the engine with the great variations of the useful momentum. The authors offer a graphic-analytical research for the motor vehicle hydrostatic transmission agreement with the driving engine characteristics. The method used of the authors offers a good agreement of the calculus results with the known experimental data. Their precision is priority determined by plotting the dependence of the engine, hydraulic coupling transformer and motor vehicle efficiency on the constructive characteristics.*

Keywords: *engine, Diesel, hydrostatic, transmision.*

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SMAT2008V39

ON THE RESISTANCE OF METALIC HELICAL SPRINGS THAT EQUIP ROAD AND RAILWAY VEHICLES

Aurelia Tănăsoiu, Ion Copaci

Metallic elastic elements, under the form of helical springs, torsion springs and laminated springs as well as ring-type RINGFEDER springs are largely utilized on road and railway vehicles, as suspension elements.

The paper mainly discusses the determination, using the Finite Element Method, of the stress state, using adequate software, the ALGOR program.The study was conducted on the metallic helical spring with bar diameter of 31mm used on the Y25 Lsdi bogie in order to increase axle load from 200 kN/axle to 225 kN/axle.

In the spatial stress state, the main stresses were determined (σ_1, σ_2, σ_3), the equivalent stress according to the von Mises criterion and the stress tensor. It is observed that the material, 50CrV4 steel, has the mechanical characteristics which can answer existing demands determined from use and corresponding to the computed stress state.

Keywords: von Mises stress, ALGOR Software, endurance testing.

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SMAT2008V40

COMPARATION BETWEEN TWO MATHEMATICAL MODEL FOR VEHICLE STABILITY STUDY TAKEN AND WITHOUT TAKEN IN CONSIDERATION THE DRIVE ACTION

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Abstract: *The paper presents a comparison between two mathematical models realized by using the experimental results and theoretical results. To highlight the impact of drivers intervention on the stability of the vehicle, is considered two mathematical models: taking and without taking into account the driver's action.*
Keywords: *mathematical model, drive action, compare.*

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SMAT2008V41

THE VALIDATION BY EXPERIMENTAL TEST OF MODEL ANALYSIS STABILITY WITH CONSIDERING THE DRIVE ACTION

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Abstract: *For stability analyses vehicles are proposed mathematical models with a greater or less than approximation of the real movement. The paper presents a comparison between calculations and experimental solutions of a theoretical model of stability analysis with consideration of action driver. This comparison validates the mathematical model proposed.*

Keywords: *stability analysis, test results, theoretical results, comparison.*

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SMAT2008V42

MODELS FOR CAR STABILITY ANALYZES WITH AND WITHOUT TAKING INTO CONSIDERATION THE DRIVERS ACTION

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Abstract*: This paper presents some researches regarding the stability of automotive, a plan model of automotive is taking into account. For this automotives plan model two mathematical models are proposed: with and without taking into consideration the drivers action. Those systems are a nonlinear differential equations form, which can be used in the vehicles* stability *analyses*
Keywords: *automotive, plan model, mathematical model, nonlinear differential equations, stability*

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SMAT2008 V43

MEASUREMENT THE TORQUE DEVELOPED BY MOTIVE WHEEL OF THE MOTOR VEHICULES

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Abstract: : *In this paper is presented a method for measuring of torque developed by motive wheel of the motor vehicles, using an interpreter to tensometric mark mounted on the back of the engine support. Follow is presented experimental verification of this method, recording the variation of this parameter. The experiment is made by driving the car – NUBIRA- among range rods with a speed of 30 [km / h].* ***Keywords:*** *tensometer, measurement, moment, cars*.

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SMAT2008V44

RESEARCHES CONCERNING THE ELECTRIC PROPULSION SYSTEM OF A VEHICLE WITH INDEPENDENT TRACTION WHEELS

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Abstract: *The paper presents the main results of the research contract CEEX X2C24: the modeling, design and testing of two original design electric motors (a brushed DC type, and a brushless DC one), the implementation of a testing bench for the designed motors, the design and test of the control system of the motors, and realization of an experimental model of vehicle, based on a Daewoo-Matiz structure.* ***Keywords****: Electric vehicle, direct drive, digital control, high torque motors*

SMAT2008V45

GENERAL ALGORITHM FOR DETERMINATION OF THE EFFORTS OF THE CRANK- SLIDER MECHANISM WITH CLEARANCE INSIDE THE CRANKPIN BEARING

Jan-Cristian GRIGORE, Nicolae PANDREA

***Abstract**: On simulate the crankpin bearing clearance by introducing an inertialess element with same length with the clearance. The obtained mechanism has two degree of movement. In the case of uniform rotation motion it obtains four differential equations with three constraints which are solved by Runge Kutta method for numerical case.*
***Keywords:** clearance, slider-crank mechanism, crankpin bearing, inertia, efforts.*

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SMAT2008V46

THE CALCULATION OF THE COMFORT INDICES, PMV AND PPD, DEPENDING ON THE DIFFERENT PARAMETERS

Mariana IVANESCU, Stefan TABACU, Ion TABACU, Ionel VIERU

Abstract*: Lately, the most of the automotives manufactures have focused on the increasing of the habitable comfort.*

The thermal comfort sensation is assures by the factors that depend on the warmth exchange between the human body and the ambient environment.

It is well known that one of the requirements to be fulfilled is that a person to be in thermal neutrality according to the comfort equation. This is described and evaluated by the PMV – PPD (Predicted Mean Vote – Predicted Percentage of Dissatisfied) indices (ISO 7730), which take into account the following six parameters: activity, clothing, air temperature, mean radiant temperature, air velocity and humidity. ***Keywords:*** *human thermal comfort, comfort zones, mean radiant temperature, PMV - PPD indices, passenger compartment.*

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SOME ASPECTS CONCERNING TESTING AND ASSESSING OF THE AUTOMOBILE PLATFORMS FOR FURTHER DEVELOPMENT OF THE *LAROM* WEAPON SYSTEM

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Abstract: *Since a NATO member, Romania developed new weapon systems, to face the demands of the modern battlefield. In this respect, Romania developed a weapon system having as its main component a multiple rocket launcher, able to deliver its fire at ranges of 40...60 km. Nevertheless, several rocket launchers won't be, by themselves, a weapon system. Therefore, the LAROM weapon system is completed with an ammunition carrier-and-loader and a fire-control vehicle. In lack of a reliable carrying vehicle, after acquiring some rocket launchers, MoD gave up the program and asked the system's integrator to look for better solutions in this respect. So, at its turn, the integrator (S.C. AEROSTAR S.A. Bacău) looked for an improved carrying vehicle. Consequently, S.C. ROMAN S.A. Braşov, issued three brand new 6x6 carrying vehicles that are Euro 3, MAN engine powered, all of them having ZF, manual shifting gearboxes. The paper presents the basics of the testing programs that have been developed by the LACEBAT Testing Lab of the Military Automotive and Logistics Department, from the Military Technical Academy, Bucharest. It also provides comparative data between the old and the new powered weapon system, i.e. the rocket launcher itself (since in the old powered version only the rocket launcher was manufactured).* ***Keywords:*** *Automotive testing, land testing, assessment, weapon system, rocket launcher*

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RESEARCH REGARDING VEHICLES BRAKING AND THE INFLUENCE ON ACTIVE SAFETY

Horia Beles, Tiberiu Nagy, Ion Preda

Abstract: *In this study were developed theoretical and experimental researches regarding the active safety systems for passenger cars. In order to validate the ABS/ASR system working algorithm and to accentuate the influences over the braking or starting processes with and without ABS/ASR, a planar dynamic model was designed for a single wheel of the passenger car. This simplified model has two inertial elements: a wheel in rotation and a mass in translational movement (the "quarter" vehicle).* ***Keywords:*** *active safety, ABS, vehicle dynamics, Matlab-Simulink, model, simulation*

SMAT2008V48

DEVELOPMENT OF INFORMATION SYSTEMS FOR AUTO DRIVERS

Gabriela Monica PANĂ, Carmen MARCU

Abstract: *The work presents aspects of the development of information systems on board on the main display and information displayed and processed by board computer. Currently the board computer acts as an integrator of all new technological devices for machinery or equipment that are simply used by drivers while driving: from GPS-s, intelligent navigation systems, to mobile phones, music players or other entertainment systems.* ***Keywords:*** *information system, display, board computer, driver*

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SMAT2008V54

MATHEMATICAL AND THEORETICAL SIMULATION OF THE STABILITY WHILE CLIMBING AN INCLINE

Helene SUSTER BADARAU, Dumitru DRAGHICI

Abstract: *The authors propose a theoretical study of vehicle stability while climbing an incline, for a vehicle they know the transition and the overall dimensions and whose center of gravity has been previously determined, thus theoretically resulting the maximum overturning and skidding angle.*
Keywords: *Stability, road,resistance,wheel,drive.*

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SMAT2008V51

ANALYSIS OF DESIGN AND RUNNING FACTORS ON THE HYDRAULIC ENERGY RECOVERY SYSTEM FROM VEHICLE SHOCK ABSORBERS

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Abstract: *During vehicle running, the shock absorbers are dissipating the energy of a significant mass that oscillates due to external loads, in an effort to damp the energy of those oscillations. Preliminary and basic simulations presented in other papers, have shown that the dissipated energy is significant and part of it may be recovered, for example using a hydrostatic system. The paper presents a new design step for these systems where the recovery task of the whole assembly, vehicle suspension named in this case recovery suspension, is considered together with the damping task. In this case influences like wheel mass, spring rate, tyre damping rate and vehicle speed are considered as influence parameters on energy recovery efficiency.* ***Keywords:*** *vehicle, energy recovery, shock absorber, hydraulics.*

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SMAT2008V53

RESEARCH REGARDING THE DEVELOPMENT OF A PLUG-IN HYBRID ELECTRIC VEHICLE E- 4WD TYPE

Danut Gabriel MARINESCU, Ion TABACU, Florin SERBAN

Abstract: *This paper presents some aspects regarding the construction of Logan ECO HYBRID prototype. It is developed on the platform of Dacia Logan and is of parallel two shafts type organized in a motorized solution (E-4WD). In order to reduce the CO2 emission in thermal mode, the standard engine K4M 1.6 l, 16 valves is fuelled with LPG. In order to test the vehicle prototype in the laboratory, a roller test bench was adapted for the road tests, it has been created a system for measuring the performances. The Logan ECO HYBRID prototype offers one novelty: LPG fuelling and E 4WD hybrid propulsion system. The EcoMatic Hybrid System was developed in such way that to be applied on the whole Dacia Logan family and can be extended at Dacia Sandero car.*

Keywords: *Passenger car, PHEV, HUV – Hybrid Utility Vehicle, E- 4WD, Liquefied Petroleum Gas.*

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SMAT2008 V52

THE ACTUAL STATE OF DEVELOPMENT OF THE ECOVITA PROTOTYPE VEHICLE

Adrian CLENCI, Adrian BIZIIAC, Pierre PODEVIN, Georges DESCOMBES, Rodica NICULESCU

Abstract: *A fundamental feature of the automobiles engines is the great variety of their working regimes. Amongst these, an important weight (80 - 90% of the vehicle's operational life) corresponds to those of low part loads, specific to the urban traffic, thus having an overwhelming contribution to the engine's fuel consumption. Although, the maximum thermal efficiency of the actual spark ignition engine is of about 30 - 35 %, in case of vehicle's urban use, it doesn't exceed 10 - 15%; consequently, it results for the fuel consumption and toxic emissions large values. Therefore, in order to determine a significant improvement of the thermal efficiency, in the present there are looked for the constructive solutions that act especially in the area of these working regimes.*

In case of the spark ignition engine, the quantitative load control by throttling the inlet pipe causes not only the increasing of the pumping work but also the decreasing of the real compression ratio. These drawbacks, caused by throttling load control method, are more important as the load level lowers and in the case of the bigger engines, they are even more amplified. Thus, it can be said that one of the most promising methods of increasing its fuel economy is the throttle-less load control and this is not possible without variable valve actuation.

Taking all these into consideration, at the University of Pitesti, thanks to a CEEX support, there is in progress the EcoVITA (ECOlogic Vehicle featuring Intake Throttle-less Actuation) project, whose main purpose is to realize an experimental vehicle, which will use as an energetic source an operational engine prototype featuring throttle-less load control by variable valve lift and timing (VVLT) and electronic fuel injection. This engine prototype was developed with the aid of a financial support granted in 2005 - 2006 by CNCSIS within the frame of a project carried out at the University of Pitesti. Keywords: fuel economy, variable valve lift and timing, throttle-less load control.

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SMAT2008V50

ABOUT THE SYNTHESIS AND STABILITY OF THE SPATIAL KINEMATIC CHAINS WITH LINEAR-ELASTIC ELEMENTS

VINTILA DANIELA-DOINA

Abstract *In this paper we aboard the mechanism with kinematic deformable elements.*
The dynamic problem it means the geometry and the mechanism cinematic that means the vibration of an cinematic deformed element to be stable.

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SMAT2008V55

Studiul comparativ al diferitelor soluții constructive de autospeciale destinat operațiunilor de deszăpezire a căilor de rulare de pe aeroporturile din România

Dragomir Costin; **Hasnaş Şerban**; **Athanasiu Dan**

Studiul reprezintă o comparație între diferitele soluții constructive de autospeciale destinate operațiilor de deszăpezire pe aeroporturile internaționale din România.În exploatarea curentă există mai multe combinații de autovehicule destinate acestor operații.
Autovehiculele sunt echipate cu diverse dispozitive de îndepărtare a zăpezii. În mod frecvent aproape toate autospeciale sunt construite în varianta cu tracțiune integrală. În lucrare se prezintă relațiile matematice privitoare la dinamica acestora.

The special hig-performance machines types use for snow clearance operating of Romain Airport areas. On this paper is related the mathematical relations concerning with special machines four snow ploughs, towable jet sweepers, compact jet sweepers and integral wheel drive.

Cuvinte cheie: rezistența la deplasare, coeficient de rezistență, tracțiune integrală, stabilitate longitudinală, compact jet sweeper, stabilitate transversală.

SMAT2008V56

QUALITY'S ASSURANCE, COMPULSORY CONDITION FOR MOTOR VEHICLES MAINTENANCE PROCESSES OPTIMIZATION

PhD. Student Dan CIUBANCAN **Professor Eugen NEGRUŞ**

Abstract:
In order to realize the maintenance processes optimization, one of the principal conditions is to assure an adequate quality.

The paper proposes the following objectives: the identification of defects' classification system, the determination of the types of inspections of quality , conception of some flow diagrams on quality's control, the establishment of some categories of quality's costs and its improvement possibilities, with the purpose of maintenance processes optimization, costs' of exploitation reduction and, implicit, motor vehicles utilization' s growing.

The maintenance processes' quality assurance is realized through control exercise by the line inspectors and/orthe final control inspectors. It's recommended that they are attested inspectors for Periodical Technical Inspection effectuation

The data delivered by inspectors can facilitate the improvement of the technological process and realize a selection of purveyors in accordance with exchange pieces quality and delivered materials .

Relying on inspection's feedback a diagnoses analysis of the maintenance system can be realized and one is able to intervene in its conception, but also in its execution mode.

SMAT2008V57

COMPARATIVE PRACTICAL STUDY BETWEEN STATISTICAL METHOD AND WEIBUL MATHEMATICAL MODEL

Drd. ing. Dan Ciupancan Prof. univ. dr. ing. Eugen Negruş

Abstract: *This paper aims the comparative studying of the results obtained using statistical method with those obtained using Weibul mathematical model, while in case the level of confidence acquired through the two models' comparing is between the admitted limits, the proposed mathematical model is validated.*

SMAT2008V58

EXPERIMENTAL STAND FOR TRYING AND TESTING THE COMPONENTS OF MOTOR-VEHICLES BRAKE SYSTEM

Constantin DUMITRU, Violeta Cristina DUMITRU

Abstract: *In oder to achieve a safe controle for motor-cars speed in all the possible situations, there are foresun two or mare braking systems for it. Braching assembly composed by a braking pedal acting upon the central braking pump built by main cylinder with pistons and compensation reservoir for liquid, is destined for creating the necessary pressure in the receiver cylindres that drive upon the proper brakes on all the motor- cars wheels. The paper presents the construction, working way and performances of an experimental stand used for trying and testing the central brake pumps, receiving hydraulic cylinders - new and standard variants. The stand was conceived and completed in a connection, which can be modulated according to the specific necessities of a certain brake component, studied at a certain moment. Both the specific designing and executing matters, and the specific testing phrases are solved, representing thus an indispensable instrument in reducing the assimilation cycle of some brake components of a real quality on which the motor-vehicles fiability depends. That is wthy all the components of the braking system must be verified and controled so that these conditions must be according to international normes and standards (ISO 9000).*

KEY WORDS: *Breke system, Testing, Stand*

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SMAT2008V59

THE RESPONSE OF A RANDOM EXCITATION NON-LINEAR SQUEEZE FILM OSCILLATOR

Petre STAN

Abstract. ***Nonlinear dynamic systems subject to random excitations are frequently met in engineering practice. The present paper consists of discussion on dynamic response of structures under random vibrations. They are random processes and commonly described by spectral density functions. We present a method for estimating the power spectral density of the stationary response of oscillator with a nonlinear restoring force under external stochastic wide-band excitation. An equivalent linear system is derived, from which the power spectral density is deduced.***

The method of the stochastic equivalent linearization is based on the idea that a nonlinear system may be replaced by a linear system by minimizing the mean square error of the two systems. The most applied and convenient procedure is used by Yingfang, L. Zhao, Q. Chen [1,3] suggestion to estimate the linearization coefficients in context with Wen's introduction of an analytical expression for the restoring force. This method has seen the broadest application because of their ability to accurately capture the response statistics over a wide range of response levels while maintaining relatively light computational burden.

The basic idea of the statistical linearization in use here approach is to replace the original nonlinear system by a linear one. Assume that a single-degree of the sferic body with a mass m, caught at end of a spring with a elastic constant given ,when the lenght of the undeformed spring is known, at random excitations in a liquid with the viscosity cofficient γ ***. for*** 20^0 ***C temperature.***

The sistem is excited by a force W which is a random process described by the spectral density function. As the force is not deterministic, the response of the structure is expected to be random. If Gaussian assumption is adopted for the force and the structure is assumed to be nonlinear, the response is expected to be Gaussian distribution as well. As a result, we obtain the standard deviation of the respons,. the velocity variance of the single-degree of freedom system, the natural frequency of the equivalent linearized system and the spectral density of the response. This is done in such a way that the difference between the two systems is minimised in some statistical sense. In this way, the parameters of the linearised system are determined. The response of the nonlinear system is approximated by the response of the equivalent linear system. So, the unknown statistics of the response are evaluated approximating the response as a Gaussian process, when the excitation is assumed to be Gaussian.

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SMAT2008V60

ANALYSIS OF SINGLE-DEGREE OF FREEDOM NON-LINEAR STRUCTURE UNDER GAUSSIAN WHITE NOISE GROUND EXCITATION

Petre STAN

Abstract. ***The present paper consists of discussion on dynamic response of structures under random load. They are random processes and commonly described by spectral density functions. Assume that a single-degree of freedom structure is excited by a force*** F ***which is a random process described by the spectral density function*** $S_F(\omega)$***. As the force is not deterministic, the response of the structure is expected to be random. If Gaussian assumption is adopted for the force and the structure is assumed to be nonlinear, the response is expected to be Gaussian distribution as well. As a result, to obtain the standard deviation of the respons,. the velocity variance of the single-degree of freedom system the relative acceleration of this structure and the spectral density of the response.***

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SMAT2008T01

INVESTIGATIONS CONCERNING THE POSSIBILITY OF CONVERTING THE DISPLACEMENT VELOCITY INTO AN ELECTRIC PARAMETER IN ORDER TO AUTOMATIZE THE WORKING PROCESS FOR AGRICULTURAL SPRINKLING MACHINERY

Glodeanu Mihnea, Alexandru Tudor, Simion Popescu, Boruz Sorin

Abstract: *Agro-technical demands imposed for the technological process of diseases combat and pest control by means of the sprinkling treatments have required the sprinklers fitting out with automatic adjusting systems of the agro-pharmaceutical liquid flow, depending on the variation of displacement velocity.*
Keywords: *converter; integrated circuit; inductive wheel; velocity; sprinklers.*

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SMAT2008T02

CONSIDERATION REGARDING THE COMPORTMENT TO ENDURANCE OF A TRACTION BAR OF A 200 HP TRACTOR, IN CASE OF THE HYDROPULS ACCELERATED TESTING

Vlăduț V., Matache M., Ganga M., Mihai M.

Key words: traction bar, testing, norms, machinery

Abstract: The traction bar is a component part of a traction device mounted on the tractor and it is use to the warping of agricultural machinery, with an importance role for the safety circulation on the public roads.

For this the bar must be testing according the European Norms in operation (Directive 89/173/CEE), for to a follow up the comportment - the mechanical resistance, in the case of an accelerated testing at minimum 2.000.000 cycle, at a frequency max. 20 Hz, follow up very good the mounting conditions on the tractor but and the true of the function.

This testing have as aim the determination of bar comportment (in simulated and accelerated conditions work), for to see if the end of the 2.000.000 de cycle appear the fissures, deformations or cracks which can imperil serious the safety on public roads.

SMAT2008T03

CONTRIBUTION TO THE STUDY OF THE INFLUENCE OF CONSTRUCTIVE AND OPERATIONAL PARAMETERS OF THE WORK TRACTOR TYRE WHEELS UPON THE DISTRIBUTION AND MAGNITUDE OF THE SOIL STRESS

Simion POPESCU, Liviu Laurenţiu DINU, Ion CÂNDEA

Abstracts: *In the paper it is analyzed the influence of constructive and work parameters of the tire wheels (types, dimensions, inflation pressure, load,) and of working conditions of the machinery (travel speed, number of passing on the same tracks etc.) over the propagation way of the pressure from the contact surface wheel-soil in the depth of soil and over the penetration resistance and of soils apparent density. . In the end it is presented the technical possibilities of modification of inflation pressure during the run, using a central tire inflation system.* ***Key words****: agricultural tractor, tire well, contact surface whell-road, soil stress, soil deformation*

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SMAT2008T04

THE GEOMETRICAL PARAMETERS DETERMINATION OF THE LAMELAR MOULDBOARDS USED AT THE MODERN PLOUGHES

Sorin – Tiberiu BUNGESCU*, Sorin – Ştefan BIRIŞ, Valentin VLĂDUŢ***, Lorin PILOCA*, Florin IMBREA***

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Abstract: În lucrare sunt prezentate rezultatele studiului efectuat asupra direcţiilor şi limitelor de evoluţie a parametrilor ce caracterizează geometria cormanelor lamelare, atât la cele indigene (prototip) cât şi la cele străine.
Key words: ***lamellar mouldboard; body of a plough***

SMAT2008T05

NO-TILL RESEARCH RESULTS IN SOUTH-WEST ROMANIA

Mircea BADESCU, Marian DOBRE, Adrian MECA

Abstract: *The paper deals with the most recent issues concerning the mechanization for the conservation agriculture as well as with the principles involved. Also, there are shown recent results on the no till technology aspects concerning the water loss in an experiment with vegetation vessels carried out by the Soil Management and Machinery Departments of the Faculty of Agronomy from Craiova. The best results were given by the mulch covered variant that has kept the highest amount of water in comparison with tilled and not tilled bare soil.*

Keywords: *mechanization, conservation agriculture, no till, available water capacity*

SMAT2008T06

INVESTIGATIONS MADE FOR ESTABLISHING LONGITUDINAL MODULUS OF ELASTICITY IN THE CASE OF POTATO CREEPING STALK

Mircea Badescu , Stelian Petrescu

ABSTRACT*: The longitudinal modulus of elasticity in the case of potato creeping stalk, is an important parameter in establishing the required demands for the specific machinery which pull out the potato creeping stalk. For experimental determination of longitudinal modulus of elasticity belonging to the potato creeping stalk, have been used two distinct methods: the vibration method and the method of simple bar lean on the ends and overloaded with a concentrated charge.*

The first method establishes on an analytical way a relation which allows the calculation of elasticity modulus when the dimension of creeping stalk sample are known as well as moment of inertial and the oscillation period of the sample embed at one end and exposed to a vibration status.

The second method of elasticity modulus determination operates with ratio between the variation of loaded charge belonging to the creeping stalk sample and increasing of deformation read to dial gauge indicator. The obtain results through the above two mentioned methods do not registries differences bigger than 6.5%.

Keywords*: longitudinal modulus of elasticity*

SMAT2008T07

THE INFLUENCE OF THE DEFORMATION OF THE TYRES AND OF THE RACE WAY ON THE TRANSVERSAL STABILITY OF THE WORKING MACHINE-TRACTOR SYSTEM

Sorin BORUZ, Mircea BĂDESCU, Mihnea GLODEANU, Constantin STAN

Abstract*: In this paper it is presented the influence of the deformation of the tyres and of the race way on the transversal stability of the machine-tractor system when moving on a cross-slope having a real inclination angle α on the level curve and the way of calquing them depending on the geometrical elements of the technical system formed so.*

Keywords*: tyres**,** tractor-row tillage machine, cross slope, external forces*

SMAT2008T08

EXPERIMENTAL RESEARCHES ON WORK QUALITY INDEX OF PEANUTS MECHANICAL HARVESTING

Alexandru Tudor, Glodeanu Mihnea, Cola Mugurel

Abstract: *From research which carried out with the funcțional model we notice that it needs the working speeds to be between 0,61-0,92 m/s and the liniar speeds of the taking up devices to be between 1,56…2 m/s, for working parameters to be optimal.*

Keywords*: pull out, detach, speed, model, peanuts*

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SMAT2008T09

CHECKING ON STAND THE SPECIFIC FEATURE OF A ELECTONIC AUTOMATIC ADJUSTING SYSTEM IN ORDER TO AUTOMATIZE THE WORKING PROCESS FOR AGRICULTURAL SPRINKLING MACHINES

Glodeanu Mihnea, Alexandru Tudor

Abstract: *The most important demand imposed for agricultural sprinkling machines is to ensure the stability of liquid rate. That is the reason for what many sprinklers are fitting out with electronic automatic adjusting systems of agro-pharmaceutical liquid flow. Such system is tested on a stand, in laboratory conditions for rise its specific feature.*

Keywords: *sprinkling machines; adjusting system; specific feature; flow; stability*

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SMAT2008T10

THE FINIT ELEMENT METHOD USED FOR THE STRESS STATE DETERMINATION AT THE SPRAYERS' NOZLESS

Sorin – Tiberiu BUNGESCU*, Sorin – Ştefan BIRIŞ, Valentin VLĂDUŢ***, Lorin PILOCA*, Florin IMBREA***

The study about the stress state from nozzles of the pest and diseases control through chemical machinery, represent a very important problem regarding the optimization of the parameters of nozzles on the basis of the minimum weight's criterion. This calculus can be done successfully by means of the analysis method with the finite elements.

Key Words: ***Finite Elements Method, COSMOS/M programme, stress, digitization***

SMAT2008T11

THE MEASURE EQUIPMENT OF THE RESISTANCE FORCES TO THE TRACTION OF THE CARRIED AGRICULTURE MACHINE ON TRACTOR REAR MOUNTED THREE POINT LINKAGE BY THE 3RD AND THE 4TH CATEGORY

Augustin CONSTANTINESCU
Simion POPESCU

Abstract: *In the paper it is presented the measure equipment by the strain gauge used for measuring of resistance forces to opposed traction, in work, by big power tractors equipped with rear mounted three point linkage of the 3rd and the 4th category according of standard SR ISO 730-1+C1.*
Keywords: *tractor, agriculture machine, traction force, strain carcass*

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SMAT2008 V61

VELOCITY FIELD FOR EPICYCLIC GEAR TRAINS

Mihaela BUCULEI, Nicolae CRACIUNOIU, Nicolae DUMITRU, Dan B. MARGHITU, Daniel PICIOREA

Abstract: **Kinematic analysis** plays an important role in the design of kinematic chains with gears and a thorough understanding of the subject is fundamental towards achieving an optimal solution. This study aims at providing an algebraic method to compute the velocities of a closed kinematic chain with gears. The method of contour equations is very efficient and can be applied to planar and **spatial epicyclic gear trains.**

SMAT2008E01

EQUILIBRIUM RELATIONS LIQUID-VAPOURS FOR THE LIQUEFIED PETROLEUM GAS

Mihai NAGI, Dan ALEXANDRU, Arina NEGOITESCU

Abstract: *In this work we present equilibrium relations of liquid-vapours for the Liquefied Petroleum Gas; Biphasic systems composed of two mixable liquids. We define the phase's equation and we trace the phases chart at a constant temperature*

Keywords: *Liquefied Petroleum Gas, equilibrium relations, liquid-vapours, Biphasic systems, mixable liquids.*

SMAT2008E02

ENERGETICALLY OPTIMIZATION OF INTERNAL COMBUSTION ENGINE RADIATOR USING THE ELECTRO-HYDRODYNAMIC ANALOGY

Victor BENCHE, Gabriela HUMINIC, Angel HUMINIC

Abstract: *In this paper are presented some results concerning energetically optimisation of the internal combustion engines radiators. The approaching is performed from energetically point of view, using electro-hydro-dynamics analogy. In this sense are studied the influences of the thermal load, hydraulic and mechanical power and the efficiency heat exchange. The study is illustrated by means of a numerical exemplification.*

Keywords: *radiator, electro-hydro-dynamics analogy.*

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SMAT2008E03

THE INFLUENCE OF BIODIESEL FUELS ON DIESEL ENGINE

Bogdan Cornel BENEA

***Abstract*:** *The use of biodiesel following international energy policies is presently finding resistance from car manufacturing companies and, sometimes, from private users. One of the reasons for resistance is a certain lack of knowledge about the effect of biodiesel on engine emissions. The first section of the paper is dedicated to the effect of biodiesel fuel on engine power, fuel consumption and thermal efficiency. In the second section the engine emissions from biodiesel and diesel fuels are compared, paying special attention to the most concerning emissions: nitric oxides and particulate matter.*

Keywords: *biodiesel; Diesel fuel, emiisions, power influence*

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SMAT2008E04

BIODIESEL PRODUCTION FROM SUNFLOWER

Bogdan Cornel BENEA

Abstract: *Abstract of 50-120 words (10 pt, italic) Biodiesel is the name of a clean burning alternative fuel, produced from domestic, renewable resources. Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a biodiesel blend. It can be used in compression-ignition (diesel) engines with little or no modifications. Biodiesel is simple to use, biodegradable, nontoxic, and essentially free of sulfur and aromatics. Biodiesel can be produced from any fat or oil such as sunflower oil, soybean oil, canola oil, palm oil, tallow to name a few through a refinery process called transesterification. It is recommended that the sunflower oil be refined and de-waxed before blending it with diesel fuel.Sunflower is a high oil content seed and average yields can produce 600 pounds of oil per acre, considerably more than soybeans. There is a great deal of interest from local areas for construction of small processing facilities for sunflower biodiesel production. Sunflower oil is priced at a premium to soybean and canola oils due to demand from the food processing industry. The price premium may make it prohibitive to use sunflower oil in biodiesel* ***Keywords:*** *Energy, biomass, fuel, natural resources, ethanol, biodiesel).*

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SMAT2008E05

BIOFUELS MARKET SWOT ANALYSE

Nicolae BURNETE, Florin MARIAŞIU, Bogdan VARGA

Abstract: *Since 2000, the European Commission has proposed and adopted a number of laws and legal instruments for the promotion and use of biofuels and renewable energy. Romania, as well as a new member of the European Union makes efforts to implement it as soon as the European Directive 2003/30/EC, which provides for the promotion and use of biofuels. According to this document, the contribution of renewable sources (including class biofuels) should increase from 14% (2005) to 22% (2010). Being the second position in Europe regarding the potential of biomass for the production of biofuels (after Poland), Romania make efforts to implement the policies necessary in the production and use of biofuels.*

Keywords: *biofuels, market, potential, SWOT analyse.*

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SMAT2008E07

LPG FUELING FOR A SMALL CARBURRETOR ENGINE

Liviu Georgescu

Abstract: *These days when oil price jumps unthinkable hights, it is necessary to look for diminishing fuel costs even for small carburettor engines. Pollution may also be diminished by using LPG fuel instead gasoline, with little or no adaptation for the engine. Tests were performed on a Daewoo Tico model car with a 3 cylinder engine of a total 695 cm^3 capacity.*

Keywords*: LPG, fuel consumption*

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FUNCTIONING CONDITIONS OF THE INTERNAL COMBUSTION ENGINES USING SPECIFIC FUELS MIXED WITH ALCOHOL

Nicolae BURNETE, Alexandru NAGHIU, Bogdan VARGA, Florin MARIAŞIU, Cristian COLDEA, Emilian BORZA, Doru BALDEAN, Adrian COSTEA

Abstract: *The paper represents a consequence of the complex theoretical and experimental researches realized for a long time (in the Biofuels laboratory from Technical University of Cluj-Napoca) with the objective of enlightening some of the internal combustion engines performances when using classic fuels mixed with alcohol. It may then be observed that using these mixtures is possible but not in any conditions.*

Keywords: Biofuels, Biodiesel, Biogas, Alcohol mixed fuels, internal combustion engines.

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ÎNCERCĂRI DE REZISTENȚĂ ÎN FUNCȚIONARE A ARBORELUI CU CAME TUBULAR

Lect. Eng. Sorin Igreț
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PhD. Ass. Prof. Eng. Ioan Hălăciugă

Abstract: *The tubular camshaft represents a modern constructive solution that, in comparison with the classic shaft, shows the following advantages: the diminishing of the mass by 0,52 kg,which means economy of material and labour and, especially, the diminishing of the inert masses.*

Due to the diminishing of the section of the shaft and of the fabrication of cams different from those of the shaft, it was imposed the necessity of the testing mechanical requirements of the shaft and of its resistance to usage of the working surfaces of mthe cams.These tests were carried out by two ways: by checking the functioning on a stand designed and made by the authors,as well as by mathematical modeling with the help of ALGOR programme.

After the testing there arose the following conclusions:

-the resistance to usage of the cams is comparable to the cams on the classic shaft;

-by comparing the values of the tensions and benching for the two alternatives of the shaft Of distribution there was found out that the deviation in percentage lies 0.9…8 % for tensions,while for benching 14.2…20.9 %.This small difference is to be explained by the values of the modules of axial resistance,namely polarization of fulkl circular sections being 5…10% higher than the same values calculated for a tubular section of the same exterior diameter;

-for none of the alternatives of calculation,namely for none of the cases of loading, the values of the admittable loading of the values were not surpassing.

Keywords *camshaft, usage working surfaces, tubular, stand*

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SMAT2008E09

EXPERIMENTAL RESULTS CONCERNING POLLUTION DECREASING FOR A HIGH POWER DIRECT INJECTION DIESEL ENGINE

Daniel IORGA, Ion Vrabie, Werner HINKEL, Liviu MIHON, Adrian IRIMESCU

Abstract: *The paper presents the experimental results obtained on a high power engine taking in consideration the possibility of smoke degree reduction by acceptable changes on the existing injection system. It is proved that by modification of the numbers of holes of the nozzle (realized by authors) and keeping the total injection surface it is conserved the injection law in order to have the same burning process; on the other hand improving the pulverization quality, decreasing of the drops dimensions and keeping the penetration distance lead to a progressive and complete burning process and, as a final conclusion, are obtained the same energetical performances and considerable decreasing of the smoke at main working regimes.*

Keywords: *direct injection, multi-hole nozzle, spraying, homogenous mixture, smoke degree, nitrogen oxides.*

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SMAT2008E10

USING BIO-FUELS INTO COMMON TRUCKS CI ENGINES

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Abstract. *This paper presents the results obtained from research activity, carried out to uses biodiesel fuel mixtures into direct injection turbocharged common trucks Diesel engines, in order to meet UE regulation. More research activities were develops in order to check the injection, fuel-air mixtures combustion parameters and engine emissions on engine fueled by classical Diesel fuel relative to mixtures of Diesel fuel and rapeseed oil ester. Engine durability was also a research goal.*

Keywords*: UE bio-fuel legislation, truck CI engines, renewable fuels, pollutant emissions.*

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SMAT2008E14

STEADY-STATE ANALYSIS OF THE DISPLACEMENTS, STRESSES AND STRAINS FIELDS FOR AN INTERNAL COMBUSTION ENGINE USING THE FINITE ELEMENT METHOD

Claudiu OBOGEANU[1], Marian POPESCU[2], Gheorghe POPA[3], Florentin POPESCU[4]

***Abstract**: A numerical analysis with finite elements method was performed in order to obtain the displacements, stresses and strains fields for a four-stroke engine mechanism. I have evolved and analysed the components response of the engine mechanism. The steady-state analysis was developed for two rotational speed conditions. The numerical analysis was evolved for maximum acceleration condition. The research results will be marked out in a proper graphical type of Ansys software.*

***Keywords:** engine mechanism, steady-state, acceleration, displacement, stress, strain.*

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SMAT2008E12

THE INFLUENCE OF ETHANOL-GASOLINE BLENDS ON SPARK IGNITION ENGINE OPERATION, PERFORMANCE AND EMISSION CHARACTERISTICS

Daniel MINIŞAN , Veneția SANDU

***Abstract:** The paper presents besides some technical aspects regarding the use of ethanol-gasoline blends in spark ignition engines some experimental determinations corresponding to the vehicle operation on conventional fuel and on ethanol-gasoline blend containing 5% ethanol concentration.*

The technical aspects were focused on the chemical and physical properties like the density, the lower heating value, octane number and volatility of the considered blend and the effect on these properties in respect to ethanol concentration.

Pollutants emissions were assessed with an NEDC (New European Driving Cycle) emission test performed on a passenger car being also assessed engine start-up time, oxygen sensor warm-up time and catalytic converter warm-up time.

***Keywords:** spark ignition engine, NEDC emission test, ethanol-gasoline blends, renewable fuels.*

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SMAT2008E11

THE MATHEMATICAL SIMULATE AT TRANSIENT STATE OF DIESEL ENGINE FUNCTION

Neculai Iurea* Alexandru Dragalina* Ionel Apostol*

***Abstract**: The river and sea ships are equipped with a complex energetic apparatuses form by many components which interact between in working time. Each of these components has particular static and dynamic properties which ensure optimal function of the engine. The main purpose for mathematical simulate is to provide a highlight analytical way of some difficult aspect specific for diesel engine function. At the same time, mathematics is putting at the scientist's hand methods of analyze to give a strong explanation of the causes and effects of the less known aspects of the diesel engine exploitation. The mathematical simulate is based on existence of some similarities between the study of two objects. If between these two objects we can establish at least one similarity-then we can say there is a relation between the real system and his model. The function in transient state of speeding of the diesel engines, made for ship propulsion, knows at least three directions:*

- *the engine function simulate, through a thermodynamically research inside of the engine cylinder;*
- *the engine function simulate, through an automatically system research;*
- *the engine function simulate, through an engine and his equipment dynamic research.*

Keywords: naval diesel engine, energy, energy balance, transient state of speeding, mathematical simulate/design, controlling system, electromechanical action, dynamic, effectiveness, function of transfer.

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SMAT2008E16

THE ANALYSE OF THE COMMAND SYSTEM FOR ADAPTIVE ADMISSION IN INSERTION PROCESS OF FUNCTIONING AT HEAT ENGINES

Marinică STAN, Dinel POPA

Abstract: *The paper presents aspects concerning the calculus of the feeding time of the command system, and the calculus of the displacement period of the piston at an insertion process of functioning.*

Keywords: *command system, engines, adaptive admission, piston, hydraulic.*

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SMAT2008E13

EXPERIMENTAL RESEARCES REGARDING THE DIRECT INJECTION IN HYDROGEN FUELED S.I. ENGINE

Niculae NEGURESCU[1], Constantin PANA[1], Marcel Ginu POPA[1], Alexandru CERNAT[2], Dorin SOARE[3]

Abstract: *Hydrogen represents an adequate fuel for spark ignition engines due to its wide flammability limits and its higher burning rate which provide engine stable operating conditions at very lean air-fuel mixtures. Thus is possible to assure the engine load qualitative adjustment (opened full throttle) instead of load quantitative adjustment, providing also the decreasing of the pumping mechanical work.Hydrogen engine performances are directly related to the used fuelling method and to the applied operating strategy.*

The paper presents the results of the experimental researches carried on SI single cylinder engine fuelled with gasoline and hydrogen addition in different proportions and also only with hydrogen. Hydrogen is admitted inside the cylinder after intake valve close thru a hydrogen valve mounted into the engine cylinder head. The hydrogen valve is actuated by a hydraulic system which provides the possibility to adjust the valve opening duration and valve opening moments, assuring a high flexibility of system tuning. The inlet of the hydrogen after the admission process provides the in-cylinder cooling effect avoiding spontaneous ignition phenomena. Another advantage of this fuelling method is that the inlet air quantity is not reduced. The main goals are the increase of the engine efficiency and the decrease of the pollutants emissions level, in conditions of maintaining at least the same density of power as gasoline engine.

Are presented the engine performances at the fuelling with gasoline and hydrogen addition or only hydrogen and also are analyzed the influences of some adjusting parameters (dosage and hydrogen percent) on energetically and polluting performances of the engine.

Keywords: *hydrogen, direct injection, hydraulic system, spontaneous ignition, hydrogen addition*

SMAT2008E17

ATTENDING ENGINE BY COMPUTER IN ORDER TO REDUCE POLLUTANT EMISSIONS

Marius STOICAN, Marin BICĂ, Corina Dana CERNĂIANU

Abstract*: Because the imposed pollution limits are lower and lower, it appears the necessity of fuel mixture management by computer (ECM) more efficient. This paper shows the mode of operation of an ECM with factors influences the fuel mixture, respectively, on emissions.*

Keywords*: pollution, ECM, control*

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THE LPG USE IN DIESEL ENGINE

Constantin PANA, Niculae NEGURESCU, Marcel Ginu POPA, Alexandru CERNAT, Dorin SOARE, Petre DESPA, Florin BUJGOI

Abstract: *The LPG is an alternative fuel with real future opportunities due to the following aspects: the NO_x emission level is lower; the PM emission is indistinguishable; CO_2 emission is maintained to the same level; the engine power is the same; the automotive autonomy increase; the HC and CO emissions level increases, but the registered values respects EURO 4 norms; LPG protects the particles filter and environment because don't contains sulphur; the infrastructure for LPG distribution already exists. Is advantageous to use LPG in diesel engine in order to reduce the pollutants emissions levels and to increase thermal efficiency which is directly related with CO_2 emission level but is very difficult to use only LPG because of its higher auto ignition endurance (CN = -2….-3). In that case is necessary to use peroxides additives for LPG but the explosion danger is very high. Another impediment appears at the liquid LPG direct injection: poor oiling properties for LPG comparative to diesel fuel. This deficiency is eliminated by additives use or by special covering of the mobile components of injection system, inside surface of the pump cylinder and injector nozzle with fluorine-polymeric substances. These disadvantages are removed through the use of the diesel gas method proposed by authors: the LPG is injected in gaseous phase in the front of the inlet valve and one small quantity of diesel fuel is injected into combustion chamber assuring the ignition of the air-LPG mixture. The injection of LPG in the front of the inlet valve provides a precise LPG dose control and all the injectors are electronic actuated. The engine keeps up its classic diesel fuelling system which is adjusted for dual fuelling. The electronic control unit for the LPG injection system (EU-LPG) is attached by the engine Electronic Control Unit (ECU) and the engine electronic control is provided by the communication between those two electronic control units. This fuelling method is very easy to imply to the existing engines or to the new engines.*

The paper presents some theoretical and experimental results obtained by authors from a research program developed for an automotive diesel engine with 1500 cm^3 displacement fuelled by diesel-gas method.

Keywords: *engine, combustion, cetane number, pollutants, efficiency*

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SMAT2008E18

CALIBRATION OF PARAMETERS OF ECM FOR EMISSION REDUCTION FOR AN OTTO ENGINE

Marius STOICAN, Marin BICĂ, Corina Dana CERNĂIANU

Abstract: *Once there is imposed limits pollution still lower, it appears the necessity of fuel mixture management by computer (ECM) more efficient. In this paper shows how the computer is calibrated in order to have low emissions when the engine is still cold and lambda sensor is not yet active.*

Keywords: *pollution, ECM, calibration*

SMAT2008E19

REFRACTORINESS OF ALLOYS FROM THE POLYNAR SYSTEM Al-Cu-Mg-Si-Mn-Ti etc., USED ON PISTON CASTING FOR HEAT ENGINES

Adriana TOKAR 1, Victor BUJOR 2, Ion SPOREA 3

Abstract: *In this paper it is tried the definition and establishing of two parameters that might assure to aluminum alloys not only raised mechanic resistance, but also an adequate refractoriness, when they are used at temperatures over 300˚C.*

From the performed tests the alloying with elements from the transition groups it got out that:

- with the increase of the copper and magnesium content (or together it increases the resistance, especially the durability, in all alloy conditions: molding, natural or artificially aged;

- in the condition thermally treated the tests of alloy in the system Al–Cu–Mg are more stable to the molded condition;

- The alloy in group Al–Cu–Mg, treated with the elements in the transition groups (either in form of micro-additives, that is Ea < 0,3%) owns satisfactory mechanic properties at environmental temperatures, but also at raised temperatures, in the molded condition, as well as thermally treated.

Because the alloy including: Cu = 3,5 – 4,5; Mg = 0,7 – 1,2; Si = 1,5 – 2; Fe = 1,2 – 1,7; Mn = 0,2 – 0,3; Cr = 0,1 – 0,18and Ti = 0,1 – 0,18% had the best plasticity properties in molded conditions and thermally treated, has been chosen as "basic" alloy, named $ATCu_4MgSi_2Fe_2$ (with micro-additives of Mn, Cr, Ti) and stood at the base of tests for long duration at 250^0 C.

Keywords: *refractoriness, aluminum, alloy, thermally treatment, mechanic resistance .*

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SMAT2008E20

EXAUST EMISSIONS OF DIFFERENT BLENDS OF BIODIESEL AND PETRODIESEL IN A MONOCYLINDRICAL DIESEL ENGINE

Tutunea DRAGOS, Bica MARIN

Abstract: *Biodiesel is a renewable, alternative diesel fuel of domestic origin derived from a variety of fats and oils by a transesterification reaction; thus, it consists of the alkyl esters, usually methyl esters, of the fatty acids of the parent oil or fat. An advantage of biodiesel is its potential to significantly reduce most regulated exhaust emissions, including particulate matter (PM), with the exception of nitrogen oxides (NO_x). In this work, two types of biodiesel and their blends with petrodiesel were selected for exhaust emissions testing in a monocylinder diesel engine. The exhaust emission of biodiesel blends (CO, CO_2, HC) were compared to normal petrodiesel. The emissions follow trends established by previous research.*

Keywords: *biodiesel, petrodiesel , exhaust emissions ,diesel engine.*

SMAT2008E21

ANALYSIS OF NOISE LEVEL INTO A MONOCYLINDRICAL DIESEL ENGINE WHEN IS FUELED WITH DIFFERENT BLENDS OF BIODIESEL AND PETRODIESEL

Tutunea DRAGOS, Bica MARIN

Abstract: *In this paper we analyzed the performance of different blens of biodiesel and petrodiesel on a monocylindrical diesel engine. Biodiesel reduces the classic diesel engine "knocking" noise.* Biodiesel has a higher cetane number, which means that biodiesel fuel will ignite more easily in a diesel engine while also reducing engine noise. *Common first impressions when using a high-ratio blend of biodiesel include reduced engine noise and a smoother engine. For this we use two type of fuel at different blends measuring the level of noise in four distinct points at 1 m of the engine with a sonometer*

Keywords: *noise, ,biodiesel, petrodiesel, sonometer, cetan number;*

SMAT2008E22

ANALYZE OF THE SPECIFIC VIBRATION MODES FOR A CAMSHAFT

Ionel VIERU, Gheorghe STAN, Viorel NICOLAE, Alexandru BOROIU, Sebastian PARLAC

Abstract: *This paper presents a modal analyze done for a camshaft. We started from the camshaft's physical model, creating the CAD model by dimensional measurements. We used as calculation method the FEM (Finite Element Method) and as software we used CATIA V5. The results obtained by calculus were then compared with the experimental data.*

Keywords: *modal analyze, crankshaft, FEM.*

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SMAT2008E23

MECATRONICS SYSTEM FOR THE EVALUATION OF ENERGETICAL PARAMETERS OF INTERNAL COMBUSTION ENGINE

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ABSTRACT:

The paper presents an informational system necessary for to implementation of the algorithm for the indirect determination of the engine's torque as a function of engine speed at different temperatures of exhaust gases. There are projected the discrete electronic components necessarily to calculus blocks realization and for the solution validation there are realized the simulations in MATLAB-SIMULINK.

KEY WORDS*: INFORMATIONAL SYSTEM INDIRECT DETERMINATION ENGINE'S OF THE TORQUE*

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SMAT2008E24

VVA FOR A SPARK IGNITION ENGINE

Marcel LUPASCU, Constantin GRIGORESCU, Dumitru CRISTEA, Florin SERBAN, Vasile DUMITRESCU

Abstract: *At the present time the automotive industry promote in series production a generation of VVT's that employs the vane-type concept, using complex shaped components with tight tolerances. These devices require materials which combine moderate strength and high wear resistance with the feasibility for mass-production, which in turn are best met by steels manufactured by the powder metallurgy (P/M) route. Without easy access to these technologies, the authors tried to test a simple way to continuously vary intake valve lift.*

Keywords*: variable valve actuation, volumetric efficiency, valve lift, phasing*

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SMAT2008E25

CONSIDERATIONS REGARDING VVA REQUIREMENTS

Marcel LUPASCU, Constantin GRIGORESCU, Dumitru CRISTEA, Florin SERBAN

Abstract: *The design of an internal combustion (IC) engine is a complex compromise between performance, fuel economy and emissions, and VVA technologies are the helpful modern solutions in this area. The authors tried to find the best requirements imposed to valve actuation mechanism with the goal to obtain as more advantages as possible.*

Keywords*: variable valve actuation, volumetric efficiency, valve lift, phasing*

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SMAT2008E26

EXPERIMENTAL STAND FOR THE STUDY OF HYBRID AND ELECTRIC VEHICLES WITH HYBRID ENERGY SOURCE

Emilian Lefter, Luminita Constantinescu, Eugen Diaconescu, Catalin Goia

Abstract: *The paper presents a hybrid electric stand having applications in the field of car making. The mechanical structure of the stand is presented, as well as its system of power supply. The latter is made up of an electric battery, an ultracapacitor and an 8 kW fuel cell, the batteries and fuel cell being able to operate either independently, or in a hybrid manner.*

Keywords: *hybrid electric stand, automotive, fuel cell.*

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SMAT2008M01

SPECTRAL DECOMPOSITION OF THE ELASTICITY MATRIX OF NITINOL

Dumitru BOLCU, Daniela TARNITA, Marius STANESCU

Abstract: *For anisotropic elasticity, the elasticity matrix can be regarded as a symmetric linear transformation on the six-dimensional spaces. In these conditions, the elasticity matrix can be expressed in terms of its spectral decomposition. The structures of the spectral decomposition are determined by the sets of invariant subspaces that are consistent with material symmetry. Eigenvectors are, in part, independent of the values of the elastic constants, but the eigenvalues depend on these values. For the cubic symmetry group of crystallography, the structure of the spectral decompositions is presented. A numerical example for the shape memory alloys named Nitinol is presented.*

Keywords: : spectral decomposition, Nitinol, symmetry group, eigenvalues, eigenvectors

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ESTIMATION BY CALCULATION OF MECHANICAL POWER LOSSES ON AUTOMOTIVE TURBOCHARGERS

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Abstract *: Nowadays diesel automotive engine is turbocharged. Regulations of CO2 emission lead also for gasoline engine to be turbocharged (downsizing). Therefore, high performances of the turbocharger are required on an even wider functioning area. That also means that these performances must be known with a satisfactory accuracy.*

Unfortunately, this is not the case for turbocharger's operation at low speeds, which is often encountered in automotive applications. Some experiments have been performed in Cnam laboratory on a turbocharger test bench equipped with a torquemeter.

Experimental results permit a coarse evaluation of friction losses based on the difference between power given to the airflow and power measured by the torquemeter. It seems that a better accuracy of these losses can be obtained by a direct mechanical calculation of friction losses but first calculations were not satisfactory.

So, it has been decided to carry out a careful analytical calculation using "classical" methods for journal bearings applied to one turbocharger and study influences of different parameters (load, clearance, eccentricity, lubricating oil viscosity…).

Then these calculations have been compared with 2D CFD results. A 3D analysis is in progress. In this paper, the results of these different computations are presented and discussed.

Keywords*: turbocharger, friction losses, journal bearings, CFD*

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SMAT2008M02

IMPLEMENTING A COMPONENT FROM A NEW SUPPLIER

Marian BRABETE

Abstract: *When changing the components' suppliers an automotive manufacturer has to submit the new components to several tests in order to verify their capability to replace the old ones. Thus, the aim of the present paper is to emphasize the phases that a cylinder head from a new supplier, has to pass in order to be validated.* ***Keywords:*** *replacement, automobile, component, provider, validation.*

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SMAT2008M03

MODIFIED SELF-CONSISTED SCHEME TO PREDICT THE THERMAL CONDUCTIVITY OF NANOFLUIDS

Kliment Hadjov

Abstract. *In this study the self-consisted scheme is generalized to predict the thermal conductivity of nano-fluids containing spherical nanoparticles with conductive interface. We assume flux jump in the particle-fluid interface in the opposite to the assumption for temperature jump in the case of thermal barrier resistance. We have obtain an upper and lower bounds to the homogenized suspension thermal conductivity according to the particle packing, which is particle surface state dependent. A comparison with the Maxwell equation is made. The proposed model is evaluated using number of sets from published experimental data to the thermal conductivity enhancement for different nanofluids.*

Key-words: *nanocomposites, nanofluids, thermal conductivity, homogenization*

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SMAT2008M04

INFLUENCE OF THE PARTICLE SIZE DISTRIBUTION ON THE THERMAL CONDUCTIVITY OF NANOFLUIDS

Kliment Hadjov, Dimitar Dontchev

Abstract: *In a previous study we have obtain an equation to predict the thermal conductivity of nanofluids containing nanoparticles with conductive interface. The model is maximal particle packing dependent. In this study the maximal packing is obtained as a function of the particle size distribution which is the Gamma distribution. The thermal conductivity enhancement depends on the averaged particle size. Discussion concerning the influence of the suspension pH on the particle packing is made. The proposed model is evaluated using number of sets from published experimental data to the thermal conductivity enhancement for different nanofluids.*

Key-words: *nanofluids, thermal properties, size distribution, size effect*

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SMAT2008M05

EFFECTIVE THERMAL CONDUCTIVITY OF NANOSUSPENSIONS WITH ANISOTROPIC INCLUSIONS

Kliment Hadjov, Mihnea Marin

Abstract: *This work proposes a homogenization technique to obtain the effective thermal conductivity of fluids containing anisotropic nanoinclusions with different shape. We assume good contact between matrix (bulk fluid) and inclusions so that there is no temperature discontinuity across interfaces. We take into account the interfacial layers conduction effect. Simple expressions between the effective thermal conductivity and the respective tensor components of the phases have been obtained. We consider the inclusions geometry with the help of shape tensor. The theoretical results are compared with experimental data and other theories.*

Key-words: *thermal conductivity, nanofluids, anisotropy, shape tensor, homogenization*

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SMAT2008M06

ADVANCED MACHINING TECHNOLOGIES FOR AUTOMOTIVE COMPLEX COMPONENT PARTS WITH COMPLEX WALLS

Tiberiu MALCIU, Madalina CALBUREANU, Raluca MALCIU

***Abstract**: The paper presents the machining process with advanced NC programs (SURFCAM 2005) of a lift-up bracket, made of aluminium alloy (zycral). The part has complex walls and it is subjected to static transitory loads and strong vibrations. As a result of a static and dynamic analyses, there were determined the critical sections that had to be taken into account by the manufacturing process.*

***Key words**: bracket, CAM, complex walls, zycral, FEM, loads*

SMAT2008M07

THE EFFECT OF THE SEPARATION ZONE ON THE PERFORMANCE OF A COMPRESSED AIR DRYER

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***Abstract:** This paper presents constructive solutions for aluminum evaporators used in compressed air dryer systems manufactured and tested at RAAL Bistrita, Romania. By the means of theoretical and experimental research the engineers at RAAL developed modern constructive solutions for compressed air dryers. The work was especially conducted towards optimizing the dryers' performance, i.e.: low level humidity of the compressed air (low dew point) and improved efficiency in dew separation.*

***Keywords:** Dryer, compressed air, aluminum evaporator, separation zone, dew point.*

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SMAT2008M08

STUDY ON VEGETAL OILS CHARACTERISTICS

Prof. Dr. ing. Mihai NAGI, ing. Ciprian CAIA, ing. Calin MOLDOVEANU

Abstract: The paper work refers to some studies and investigations done over the behavior of the vegetal oil on diesel injection, in conditions of high pressure and temperature.
Keywords: biodiesel, pyrolysis, atomization, polymerisatio, alcanes, alkenes, esterification.

SMAT2008M09

STUDIES ON HEAT EXCHANGES WITH FIELD TUBES

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Abstract In the paper the authors are calculated, based on experimental research, the thermal and dynamics performances of the Field tube for heat exchanges. A comparative study has been completed between the types of heat exchangers an other types presented in the Field literature.
Key words: tube, heat, transfer, Field, exchanges

SMAT2008M10

BIO-FUELS REPLACING CLASSIC FUEL

Oana-Victoria OTAT, Alexandru-Mihai DIMA, Gabriel-Catalin Marinescu

Summary: *This paper presents one of the future alternatives to classic fossil fuel for automobiles all over the world: bio-fuels. It is done a brief description of the types of bio-fuels, how they are produced depending on their use, what are their properties compared with fossil fuel and what is their development until now. After that it is done a short overview on the future possibilities to develop bio-fuel, including the advantages and disadvantages.*
Keywords: *bio-fuel, bio-ethanol, bio-diesel, bio-mass, first/second generation (bio-fuel), perspectives.*

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SMAT2008M11

NEW TECHNOLOGY FOR COMPOSITES BASED ON TUNGSTEN POWDER OBTAINING

Cristina Ileana 1 PASCU 1, Alexandru 2 STANIMIR 2

Abstract. *This paper presents a study on the quality of composites, based on tungsten powder, realized by a new proposed technology, which eliminates the operation of the paraffin infiltration and, also, the uniaxial die compaction that is the dominant mode of powder compaction. But the powder does not respond uniformly to the applied pressure, consequently obtaining the target density and the strength levels are the primary concerns. Because tungsten is a powdery metal with a high melting temperature, the technical itinerary of sintering with liquid phase, typical for Powder Metallurgy, is the only mechanism that produces heavy alloys with a high density. Also, for eliminate the operation of the paraffin infiltration, it was tested with copper 2% as an additional element and then prepared through isostatic pressing. N this studyt is underlined the influence of some technological parameters on the quality of these pseudoalloys. Finally, a comparative study has been made between the final values of the hardness, density and the microstructural aspects, of these compositess based on W-powder, obtained through the new proposed technology and the actual technology by Powder Metallurgy.*

Keywords: *hydrostatic pressure, new technology, composite, tungsten, density, hardness*

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SMAT2008M12

INFLUENCES OF WEAR OF PCBN INSERTS, DEPTH OF CUT, FEED RATE AND CUTTING SPEED ON SURFACE ROUGHNESS IN FINISH TURNING OF HARDENED 205 CR115 STEEL

Alexandru STANIMIR, Ileana Cristina PASCU

Abstract: *In this study, the influences of cutting edge wear, depth of cut, feed rate and cutting speed on surface roughness in finish turning of hardened 205 Cr115 steel were experimentally investigated. In order to find out a mathematical relation of polynomial type which has to describe how the roughness parameter Ra depends by the 4 considered influence factors, it has been used a composed, central with 25 experience program. This research results shows that for the domains of variation chosen for the considered parameters a_p, f, V_c and VB, the depth of cut and cutting speed influence in a smaller measure the roughness of cutting edges. Instead, the roughness is rising once with the advance and shows a variation with minimum function by wear , the smoothest surfaces being obtained for a wear VB = 0,05..0,15mm. The determined relation shows that even the interactions of one of considered factors could influence in a significant way he roughness of cutting edges.*

Keywords: hardened steel, roughness, PCBN, wear, depth of cut, feed rate, cutting speed

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SMAT2008M13

NITINOL: PROPERTIES AND APPLICATIONS

Daniela TARNITA, Dan TARNITA, Nicu BIZDOACA, Cosmin BERCEANU

Abstract: *The paper presents the principal properties and ones of the most known applications of Nitinol. SMA based on Ni-Ti alloy are the alloys most frequently used in commercial applications because they combine good mechanical properties with shape memory effect. One of the most known intelligent materials is nitinol which offers many functional advantages over conventional implantable alloys. Applications of SMA to the biomedical field have been successful because of their functional qualities, enhancing both the possibility and the execution of less invasive surgeries. The biocompatibility of these alloys is one of their most important features. Different applications exploit remarkable properties of Nitinol like: superelasticity and force hysteresis, the shape memory effect (one-way or two-way), the steerability and torquability, less sensitivity to magnetic resonance imaging, excellent corrosion resistance. Because of their properties, there is a great technological interest in the use of SMA for different applications. Super-elastic Nitinol has become a material of strategic importance as it allows to overcome a wide range of technical and design issues relating to the miniaturization of different medical or nonmedical devices.*

Keywords: *Nitinol, properties, nonmedical applications, medical applications*

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SMAT2008M14

PLASTIC DEFORMATION OF MATERIAL IN THE AREA CUTTING PROCESSING THROUGH VIBROSPLINTERING

Bebe TICA Stefanita CIUNEL

Abstract. *This paper demonstrates that the deformation of material in the area for the deployment of chips by vibrosplintering fall into the simple pattern of deformation of the splinter, namely adiabatic shear.*

This pattern of distortion and low orează effort shearing unit, which leads to a reduced consumption of energy, so a atuu in addition to using ultrasonic vibrosplintering method of processing superfine, demonstrated in other works by authors.

Keywords: *cutting process, vibrosplintering, splinter, mouldability*

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SMAT2008M15

CONSIDERATIONS ON CONTACT SPLINTER-TOOLS TO PROCESSING THROUGH ULTRASONIC VIBROSPLINTERING

Bebe TICA, Stefanita CIUNEL, Ovidiu Vasile Campian

Abstract: *In the work being presented influence the direction of vibration of cutting tools on the conditions of friction between the chip and areas of clearing and settlement tool. Ultrasonic vibrosplintering bring a ninth kinematics of the contact-cutting tool of material, by its relative position and direction of vibration tool.*

Article shows the effects of this new cinematici contact in ultrasonic vibrosplintering referring to the conditions and results ultrasonic vibrosplintering by comparation with conventional splintering.

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SMAT2008M16

RESEARCHES REGARDING METHODS OF APPLYING THERMOCHEMICAL TREATMENTS TO IRON-MADE SINTERED PARTS RONDE TYPE

Traian POPESCU, Ilie DUMITRU, Victor OȚĂT, Gheorghe POPA

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SMAT2008M17

EFFECTS OF QUENCING AND ANNEALING TREATMENTS ON THE MECHANICAL PROPERTIES OF SINTERED STEELS

Traian POPESCU, Mihnea CĂTĂNEANU,
Cezar Alin UNGUREANU, Victor OȚĂT

Abstract. *The mechanical property values of sintered steels obtained by powder metallurgy are presented in this work. This properties result by annealing after quenching thermal treatment. The sintered steels are based on iron powder type Distaloy AE (Hoganas-Sweden) with different carbon concentrations addings (< 1%C). The quenching and annealing treatments were performed in a thermal and thermochemical treatment fuenace – Pattent No. 101496 O.S.I.M. (Bucharest – Romanian Pattent Office). The experimental session consist in quenching treatment of powders by heating at 850-900°C, followed by annealing treatments (heating at 300-500°C) and cooling with or without mechanical stearing by charge rotation in furnace atmosphere.*
Keywords: *powder metallurgy, steel sheets, mechanical properties, thermochemical treatments, carburizing, annealing.*

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SMAT2008M18

STUDY OF SINTERED STEELS OBTAINED AFTER QUENCING AND ANNEALING TREATMENTS

Traian POPESCU, Mariana NICULESCU, Carmen MARCU

Abstract. *The mechanical property values of sintered steels obtained by powder metallurgy are presented in this work. These properties result by annealing after quenching thermal treatment. The sintered steels are based on iron powder type Distaloy AE (Hoganas-Sweden) with different carbon concentrations addings (< 1%C). The quenching and annealing treatments were performed in a thermal and thermochemical treatment fuenace – Pattent No. 101496 O.S.I.M. (Bucharest – Romanian Pattent Office). The experimental session consists of quenching treatment of powders by heating at 850÷900°C, followed by annealing treatments (heating at 300÷500°C) and cooling with or without mechanical stearing by charge rotation in furnace atmosphere.*
Keywords: *powder metallurgy, steel sheets, mechanical properties, thermochemical treatments, carburizing, annealing.*

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SMAT2008M19

STUDIES AND RESEARCH REGARDING THE ROUGHNESS OF THE SURFACES GOT BY TURNING THE ALLOYED STEEL

MARIUS ZAMFIRACHE

Abstract

This paper contains the experimental program for establising the workability functions regarding the on turning the and the results of the experimental reserch on machining alloyed steel.

*Key words****: Alloyed steel, turning, roughness surfaces, liniar functions, analysis regression.***

SMAT2008M20

RESEARCH REGARDING THE ROUGNESS OF THE SURFACES TITANIUM ALLOYS (TIAL6V4) TURNING

MARIUS ZAMFIRACHE

Abstract: *This paper presents the results of some experimental research regarding the roughness of the surfaces for titanium alloys: TiAl6V4 in the case of the turning process using tool carbide type K20.*

Keywords**:** ***Titanium alloys, turning, roughness surfaces, non linear functions, analysis regression..***

SMAT2008M21

CONSIDERATIONS ON THE COMBUSTIBILITY OF THE COMPOSITES BY RESINE - UNWONERE TEXTILE FIBRES

Gelica STĂNESCU, Monica MATEESCU,
Adrian BERCEANU, Anca MOGOŞANU, Mario TROTEA

Abstract: *The paper present considerations on the horizontal combustion of the composite materials based on resin-unwoven textile fibres*. ***Keywords:*** *prepolimerised, environment, thermoformation, prepolimerised, preformation.*

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SMAT2008M22

TECHNOLOGY AND MODULATED EQUIPMENT FOR OBTAINING COMPOSITES MATERIAL POLYESTER – TEXTILE FIBRE

Conf. dr. ing. Gelica STĂNESCU, Conf. dr. ing. Dumitru NEAGOE, Conf. dr. ing. Monica MATEESCU, student Anca MOGOŞANU

Abstract: *This paper presents a few working technologies and modulated equipments used for obtaining polyester-textile fibre composites materials.* ***Keywords:*** *contact forming, cold pressing formation, composite material, resin, flax, cotton, hemp.*

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SMAT2008M23

INFLUENCES OF WEAR OF PCBN INSERTS, DEPTH OF CUT, FEED RATE AND CUTTING SPEED ON CUTTING FORCES IN FINISH TURNING OF HARDENED 205 CR115 STEEL

Alexandru STANIMIR, Gabriel BENGA

Abstract: *In this study, the influences of cutting edge wear, depth of cut, feed rate and cutting speed on cutting forces in finish turning of hardened 205 Cr115 steel were experimentally investigated. In order to find out a mathematical relation of polynomial type which has to describe how the cutting forces and specific cutting forces components by the 4 considered influence factors, it has been used a composed, central with 25 experiences program. These research results show that, for the domains of variation chosen for the considered parameters a_p, f, V_c and VB, the increase of depth of cut, feed rate and flank wear increase the cutting forces components F_f, F_p and F_c and the cutting speed influence in a smaller measure these forces. Instead, the specific cutting forces K_f, K_p and K_c are rising once with the flank wear and decrease once with the advance of depth of cut. The influence of feed rate and cutting speed on the specific cutting forces is smaller. The ratio of forces F_p/F_c is rising once with the flank wear.*

Keywords: hardened steel, cutting forces, PCBN, wear, depth of cut, feed rate, cutting speed

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SMAT2008M24

THE INFLUENCE OF MOLYBDENUM IN THE STRUCTURE OF CONTACTS W-CU-MO OVER THE ELECTRICAL PROPERTIES

Marin GAVRILĂ

Abstract: *The pseudo-alloys W-Cu-Co are use for fabrication of electrical contacts in high voltage and current systems and must comply several conditions:*
1.good refractory, low dilatation coefficient, good mechanical resistance and good resistance at electrical discharge.
2.good electrical and thermal conductibility, low electrical resistivity.
It will be analyzed the variation of resistivity in volume and the nominal current depending of Mo percentage.

Keywords: *pseudo-alloys, electrical contacts, molybdenum.*

SMAT2008M25

ABOUT OF THE INFLUENCE OF THE PRODUCTION STOCKS' SIZE ON THE AUTOMOTIVE MANUFACTURING PROCESSES QUALITY

Minu MITREA

Abstract: *This paper presents some aspects about the influence of the production stocks variation on the manufacturing processes quality. In this respect, I present a depositing costs evaluation model, a manufacturing quality indicator and a correlated complex indicator between the automotive manufacturing quality processes evolution and the store costs.* ***Keywords:*** *automotive manufacturing processes, production stock, quality assurance, quality indicators*

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SMAT2008M26

RESEARCHES CONCERNING THE DEVELOPMENT OF A LUBRICANT FOR THE SURFACES MADE IN CONTACT AT GREAT SPEED

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PROF. DR. ING. TĂRÂȚĂ DANIELA - UNIV. CRAIOVA, FAC. MECANICĂ

Abstract: The paper present the preliminary results of the research concerning the development of new friction modifiers composite. On present the results of chemical, metallographic and thermal analysis and same mechanical properties.
Keywords: composites, lubricants, Friction Modifiers

SMAT2008M27

THE ESTIMATION OF THE RESIDUAL STRESS LEVEL FROM THE WELDED COMPONENTS

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Abstract : The goal of this paper is to present the results of the researches concerning the development of a control method dedicated to estimate the residual stress level in the welded railway recipients. The studies were focused on the particular situation when a mechanical stress relaxation treatment was applied after the welding process
Key words: residual stress, stress relief, heat treatment, vibration method

SMAT2008M28

CONSIDERATIONS LOOKING THE CALCULUS OF MULTILAYER COMPOSITE FRAMES TO THERMAL SOLICITATIONS

Gabriela Monica PANĂ

Abstract: The paper puts in evidence the particular problems set by the calculus of the composite frames through the method of the finite elements to thermal solicitations. Using of the multilayer model can represent the repartition of the temperature in each layer through linear approximations, conveniently simplifying the problem. This method permits, for anisotropic material, to take count of the component materials properties depending on temperature. ***Keywords:*** *multilayer, composite, frame, thermal, solicitations*

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SMAT2008M29

ERROR ON THE GEOMETRICAL SHAPE OF TEETH PROFILE

Alina DUTA, Ludmila SASS

Abstract: *It is presented a mathematical model of the longitudinal and transversal vibrations of the holder tool-post shaft of the FD320 milling machine that caused errors on the geometrical shape of teeth profile. These displacements are important because influence errors of cylindrical gears and their functioning correctly, without noise in practice.*

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SMAT2008M30

EXPERIMENTAL STUDY OF A FULL CORRECTION OF SNAILS WITH MORE BEGINNINGS - THE CONVENTIONAL GADGET

Prof. dr. ing. Nour. I. CRISAN, Conf. dr. ing. Dumitru NEAGOE, Conf. dr. ing. Gelica STĂNESCU, ing. drd. Adrian BERCEANU

Abstract: *In the present paper, presented an experimental study on a full correction of snails with more beginnings, on a conventional machine-tool results and conclusions of this process*. ***Keywords***

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SMAT2008M31

TEHNICI DE GRAFICA MODERNA FOLOSITE IN PROTOTIPAREA VIRTUALA

George GHERGHINA, Dragos POPA, Mihaela BOGDAN, Cristian GLUGA

Rezumat: *Lucrarea prezinta aspecte referitoarela utilizarea elementelor moderne de grafica tehnica in prototiparea virtuala. Prototiparea virtuala este un process care foloseste un prototip virtualin locul prototipului fizic pentru testarea si evaluarea elementelor specifice ale produsului proiectat. Prototipul virtual este creat pe computer cat mai aproape de caracteristicile si conditiile reale de functionare astfel incat sa permita simularea functionarii pentru indeplinirea rolului pentru care a fost proiectat. Prototipul virtual permite inlocuirea procesului clasic de proiectare astfel ca elaborarea documentatiei grafice care reprezinta un important volum de munca sa fie inlocuita de metode CAD/CAM care maresc conditiile de eficienta.*

Cuvinte cheie*: grafica tehnica,proiectare de produs, prototip virtual.*

SMAT2008M32

OPTIMIZATION BY LINEAR PROGRAMMING OF CERTAIN FLEXIBLE SPINAL COLUMNS UTILIZED TO POLY-ARTICULATED ROBOTS

Violeta Cristina DUMITRU, Sorin DUMITRU

Abstract: *Every new or changed product that is designed should be built and tested at 1:1 scale. There two factors preventing this: time and cost. Modeling on scale takes time for execution and test delaying launching, and thus, reducing every advantage of the new product. In our more and more competitive world, time needed for design, development, test, fabrication and launching of a new product should be reduced to a minimum practical. This paper presents a mathematical model for the linear optimization of a flexible spinal column used to poly - articulated robots. The first step represented the replacement of the reality with a simplified (idealized) pattern in order to determine certain simplifying presumptions. We based our analyses on the premises that the reduction of the compression forces in columns reduces the risk of buckling and make easier to reduce the dimensions of the model. The structure uses three (secondary) super – elastic spinal columns connected only to the border disk and a central (primary) one attached rigidly to all disks, equidistant one to another. The optimization problem involved the determination of values of the variables, subject submitted to various functional and regional compulsions. The item that must be sent to minimum is the cost of the column that includes materials and manufacturing costs. The extremes for the satisfaction of equations have been graphically represented and as a result it was determined a feasibility area. The arguments for the simulation of the new models are clear. It is cheaper and faster than the physical building of a real system and it is better that design errors are found on model.*

Keywords: *poly-articulat robot, fexible column, optimization*

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SMAT2008M33

STANDPOINTS REGARDING DESIGN OF PRODUCTS USED IN THE AUTO INDUSTRY

Constantin DUMITRU, Violeta Cristina DUMITRU

Abstract: Design is nor solely the achieving of technical solutions but also creating useful products which satify and appeal to their use.There are three broad areas of design activities, technical, ergonomic and aesthetic. Subjects convered include form design, design for manufacture and assembly, materials and process selection and industrial design. One of the goals during the embodiment stage should be to optimize the number of components. From the point of view of assembly, the smaller the number of components the easier assembly will be. However, reducing the number of components implies an increase in manufacturing complexity for those components. This is trade off, but the initial aim should be to ascertain the minimum number of components.

Keywords: *auto components, form design, manufacture*

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SMAT2008M34

THE ENHANCEMENT OF HEAT TRANSFER PROPERTIES OF RUBBER COMPOUNDS BY THE REINFORCEMENT WITH CARBON NANOTUBES

Eden MAMUT, Camelia BROTAN

Abstract: *The study of rubber and rubber-like materials is an on going research activity. The paper includes the results of a research project dedicated to the investigation of the use of CNT for reinforcing natural rubber. The focus of the project was on the improvement of the heat transfer properties.*

Keywords: *natural rubber, carbon nanotubes, heat transfer.*

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SMAT2008M35

THE DEVELOPMENT OF A NEW CLASS OF FUELS WITH COLLOIDAL DISPERSION OF SOLID FUEL NANOPARTICLES

Eden MAMUT, Luigi ALLOCCA

Abstract: *The paper includes the results of a study on developing colloidal dispersions of nano powdered solid fuel particles in a classical fuel matrix. From the fluid mechanics point of view these compounds are called nanofluids.*

The analysis proposed by the authors includes the thermo-physical properties of proposed solid powders and the resulting colloidal mixtures and the consequences on the injection and combustion processes in the Internal Combustion Engines. ***Keywords:*** *nanoparticles, fuels, internal combustion engines, colloidal solutions, combustion models.*

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SMAT2008M36

THE CALCULUS OF DEFORMATION COEFFICIENTS FOR THE SOIL UNDER MACHINE MASSIVE FOUNDATIONS

prof.dr.ing. Ivona Georgescu

Abstract

In the paper some values for coeficients of deformation C_x, C_z, $C_{\square}$ are calculated.

The results are obtained by running a Pascal interactive program for IBM PC and are given in both numerical and graphical formats, for different types of foundation soil and dimensions.

SMAT2008M37

EFFECT OF STIFFNESS UNCERTAINTIES ON THE AEROELASTIC STRUCTURES

Stefan C. Castravete and Raouf A. Ibrahim

Abstract: *This paper deals with the investigation of the influence of span-wise distribution of bending and torsion stiffness uncertainties on the flutter behavior of an aeroelastic wing using a stochastic finite element approach. The analysis adopted a numerical algorithm to simulate unsteady, nonlinear, incompressible flow (based on the unsteady vortex lattice method) interacting with linear aeroelastic structure in the absence of uncertainties. The air flow and wing structure are treated as elements of a single dynamical system. Parameter uncertainties are represented by a truncated Karhunen-Love expansion. Both perturbation technique and Monte Carlo simulation are used to establish the boundary of stiffness uncertainty level at which the wing exhibits flutter in the form of limit-cycle oscillations (LCO) and above which the wing experiences dynamic instability. The analysis also includes the limitation of perturbation solution for a relatively large level of stiffness uncertainty.*

Keywords: *Flutter, vortex-lattice method, aeroelasticity, fluid-structure interaction, perturbation method, uncertainty.*

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SMAT2008M38

MATHEMATICA - PACKAGES FOR PLANAR KINEMATIC CHAINS

Nicolae Craciunoiu, Nicolae Dumitru, Dan B. Marghitu, Filip G. Ciolacu

ABSTRACT: In this paper, the analysis of planar mechanisms with dyads is studied using *Mathematica*. First a classification of dyads is introduced and then *Mathematica* packages for driver link and dyads are explained. The analysis provides a consistent coding scheme for planar mechanisms. The advantage of the classification of a system lies in its simplicity. The solution of the whole system can then be obtained by composing partial solutions. This approach will eliminate the need of storing complete mechanism information in a large database.

Keywords:*Mathematica*,kinematicchains,dyads

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SMAT2008M39

TENTACULAR ROBOT WITH APLICATIONS IN THE AUTOMOTIVE INDUSTRY

Sorin DUMITRU, Cristian COPILUSI, Violeta DUMITRU

Abstract: *– In this paper it is presented a robotic structure with flexible elements which can be utilized for the endowment of the fabrication lines of the automobiles body. This utilization in different domains can be guaranteed by the modular construction with redundant activity and by utilizing multiple vertebrate. The modular construction of the system can allow two acting modes, respective acting by wires with a flexible vertebrate column and the acting with flexible vertebrate column by pushing, respective drawing. We propose a comparison between the two acting modes by the point of view of the charging of radial dimensions and of the functional capacities in principal for the utilization in medicine.*

To point out the structural and the acting advantages of the robotic system we will use analyze with the finite elements in static and dynamic conditions.

Key-words: *robot, flexible unit, finite element, snake-like robot, redundant driving*

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SMAT2008M40

A TRAINING SUITE FOR IMAGE OVERLAY AND OTHER NEEDLE INSERTION TECHNIQUES

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Abstract. In order to develop accurate and effective augmented reality (AR) systems used in MR and CT guided needle placement procedures, a comparative validation environment is necessary. Clinical equipment is prohibitively expensive and often inadequate for precise measurement. Therefore, we have developed a laboratory validation and training system for measuring operator performance using different assistance techniques. Electromagnetically tracked needles are registered with the preoperative plan to measure placement accuracy and the insertion path. The validation system provides an independent measure of accuracy that can be applied to various methods of assistance ranging from augmented reality guidance methods to tracked navigation systems and autonomous robots. In preliminary studies, this validation system is used to evaluate the performance of the image overlay, bi-plane laser guide, and traditional freehand techniques. Perk Station, an inexpensive, simple and easily reproducible surgical navigation workstation for laboratory practice incorporating all the above mentioned functions in a "self-contained" unit is introduced.

Keywords: validation system, augmented reality, image overlay, mri, needle placement, percutaneous procedures.

SMAT2008M41

STEADY-HAND MANIPULATOR FOR RETINAL SURGERY

Iulian Iordachita, Ankur Kapoor, Ben Mitchell, Peter Kazanzides, Gregory Hager, James Handa, and Russell Taylor

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Abstract. *This paper describes the ongoing development of a robotic assistant for microsurgery and other precise manipulation tasks. It reports a new and optimized version of a steady-hand manipulator for retinal surgery. The surgeon and the robot share control of a tool attached to the robot through a force sensor. The robot's controller senses forces exerted by the operator on the tool and uses this information in various control modes to provide smooth, tremor-free precise positional control and force scaling. The result is a system with a higher efficacy, flexibility and ergonomics while meeting the accuracy and safety requirements of microsurgery.*

SMAT2008M42

CAD-FEA DEVELOPMENT BASED ON ARX LIBRARY

Adrian ROŞCA, Ilie DUMITRU

Abstract: The paper presents a way to extend the basic capabilities offered by Mechanical Desktop, using the ARX (Autocad Runtime Extension) set of library. This development uses the native graphic entities (such as NURBS surfaces, for geometric modeling, and other basic entities, for mesh generation and postprocessing) and enhances their behavior with thermal analysis capabilities. This implementation can solve a thermal analysis problem for a direct problem, when the unknown is the thermal distribution along the nodes (as any other commercial FEA software) and also a reverse problem, when the nodal temperatures are already obtained from an infrared measurement but the unknown is the load vector, so we can obtain the thermal sources involved the analysis. The settlements introduced by ISO 10303 STEP and other related standards are used to combine these aspects of a CAD approach. ***Keywords: CAD, FEA, ARX***

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SMAT2008R01

EFFICIENT GPS MEASURING METHODS FOR LAND COMMUNICATION ROUTES

Nicolae Băbucă Mihnea Marin

Abstract: *Recent developments in differential GPS (DGPS) services have concentrated mainly on the reduction of the number of permanent reference stations required to cover a certain area and the extension of the possible ranges between reference and rover stations. Starting from networked DGPS stations where all stations are linked to a central control station for data correction and modeling, the most advanced technique nowadays is based on the virtual reference station (VRS) network concept. In this case, observation data for a non-existing "virtual" station are generated at the control center and transmitted to the rover. This leads to a significant improvement in positioning accuracy over longer distances compared to conventional DGPS networks.*

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SMAT2008R02

THE INFLUENCE OF THE DIESEL URBAN TRANSPORTATION VEHICLES OVER THE CHEMICAL AND NOISE POLLUTION

Corneliu COFARU, Daniela FLOREA, Stelian TARULESCU

Abstract: *Vehicle emissions problems are not limited to the cities in highly industrialized countries. Regarding the pollution in urban areas, an important element is the percentage of the diesel engines vehicles from the traffic flows. The diesel urban transportation vehicles have a big impact over the chemical and noise pollution. In this paper is presented a study about the impact of urban transportation on the pollution in the historical centre of the Brasov city. There ware made traffic flow measurements, chemical pollution measurements and noise measurements.*
Keywords: *vehicle, pollution, chemical, noise, transportation.*

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SMAT2008R03

URBAN AREAS CHEMICAL POLLUTION IN FUNCTION OF THE TRAFFIC FLOW SIZE AND COMPOSITION

Corneliu COFARU, Daniela FLOREA, Stelian TARULESCU, Radu TARULESCU

Abstract: *Congestion of public road networks is a growing problem in many countries. Authorities are developing initiatives to manage the traffic, but no remedial strategy can be better than the information upon which it has to rely. Air pollution, both indoor and outdoor, is a significant cause of health problems worldwide. Urban and rural outdoor environments contain infections, allergens, irritants and chemical toxins that can reduce the quality of life and cause disease. To solve this problems are needed many measurements and studies in order to establish all the pollutant sources.*

Keywords: *pollution, chemical, transportation, air, urban area.*

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SMAT2008R04

USING GPS DEVICES FOR COLLECTING TRAFFIC DATA

Dinu COVACIU, Daniela FLOREA, Ion PREDA, Janos TIMAR

Abstract: *As the traffic volumes are increasing every day, collecting data about traffic is more and more difficult, and requires much expensive equipment. This paper presents a method and a tool for collecting these data based on cheap GPS devices. The GPS devices are currently used for navigation and monitoring vehicle position, and they can be used also to collect points and record tracks, and the data can be converted in information about the dynamic behaviour of the vehicle.*

Keywords: *traffic, GPS, data acquisition, software tool, CAD programming.*

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SMAT2008R05

ANALYSIS OF RUNNING CONDITIONS OF A HYDRAULIC HYBRID VEHICLE IN URBAN TRAFFIC CONDITIONS

eng. PhD. student Comănică Bogdan DĂNILĂ , eng. Prof. Dr. Gheorghe Alexandru RADU, eng. Prof. Dr. Horia ABĂITĂNCEI, eng. Tutor Sebastian RADU

***Abstract**: Currently, there is a need for alternative propulsion systems to ensure the requirements of pollution and consumption, particularly in the urban environment. The paper presents two hydraulic schemes and analyzes traction, consumption and pollution aspects. The analysis is done using a multibody simulation program, which allows analysis of the whole propulsion system – considering the vehicle operating conditions. A mechanical propulsion system is considered as reference. There are considered the hydraulic solution with constant and variable pump. Preliminary simulation demonstrate the potential of significantly reduction of emissions even for hydraulic hybrid propulsion system with a constant volume hydraulic pump, where vehicle speed control is obtained controlling engine speed.*

***Keywords:** Motor vehicle, hydraulic hybrid, brake, energy recovery.*

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SMAT2008R06

EQUIPMENT DESIGN FOR CONTINUOUS ROAD TRAFFIC COUNT

Nicolae FILIP, Florin SUCIU

***Abstract:** In the paper are presented the results of the research work carried out in order to design a new equipment used for vehicles count. The designed equipment was test in laboratory conditions and at the moment it is ready to be used in traffic. This equipment is able to registered simultaneous data from different 12 traffic ways.* ***Keywords:** logger, magnetoresistive, soft, hard, tests.*

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SMAT2008R07

RESEARCH REGARDING THE VEHICLES IDENTIFICATION

Nicolae FILIP

Abstract: *Abstract of 50-120 words (10 pt, italic) In the paper are presented the research carried out for promote a new method for identify the vehicles on road traffic especially in urban area. In this respect was studied the conventionally methods which consist in weight evaluation and vehicles length identification. The proposed method consist in a complete shape scan using heigh level laser sensor able to describe the vehicles by identification and traffic parameters point of view.* ***Keywords:*** *shape, laser, digital, scan, compare.*

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SMAT2008R08

PIRACY IN TRANSPORTATION

Conf. dr. ing. Ioan Halaciuga
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Abstract:

The assurance of transportation security represents a complex and highly important activity that aims at preventing facts of extreme gravity, among which piracy counts, too.

Stricto senso, by piracy we mean the fact by which members of an infractional organization seizes by different ways a means of transport, the goods or persons ob board of it. Nowadays, the notion of piracy has extended even upon other domains, signifying the illegal practicing of several professions or the illegal appropriation of the right of intellectual property.

Piracy represents a dangermas it creates very large damages to transport operators and disturbs the right unfolding of the activities from this area. The insufficiency or ambuity of both the national and international legislation ,as well as the very high profits resulting from deeds specific to piracy have turned this type of activity into the getting intensified, instead of bringing upon eradication.

It is necessary that the entire international community should unite its efforts as to stop this type of offences ,so as to ensure a climate of safety during the ungolding of transportation activities.

Keywords*: piracy, offences, transport*

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SMAT2008R09

THE COUNTERACTING OF THE TERRORIST ACTIONS IN THE FIELD OF TRANSPORTATION

Conf. dr. ing. Ioan Halaciuga, S. l. ing. Sorin Igret

Abstract *The international community is confronted with ever graver threats against the world security and order, with new manifestation forms of the delinquency, being deeply engaged in fighting against this scourge from the logistic, operational and financial point of view.*

After the collapse of "The Twin Towers" , USA, September 11-th 2001, "the trains of death"from Madrid (March 11-th 2004) , "the subways and buses of death" from London (July 07-th 2005) and other terrorist deeds that continued to maintain the planet under a continuous terror, the international community has to face a new wave of consequences, more and more difficult to manage, under conditions of a globalised society in which the treats agsinst the security received transnational characteristics, while the threatre of terrorist operations covers the entire world.

The present study analyses the way of manifestation of the terrorist actions in different branches of transportation activities and measures that have to be taken at the national and international level for their counteracting.

Keywords: *terrorism, threat, cooperation, victims*

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SMAT2008R10

ASPECTS CONCERNING THE WAY ROUNDABOUTS IMPROVE INTERSECTION SAFETY

Ariadna ILIUȚ, Janos TIMAR, Corneliu COFARU

Abstract: *In this paper we presented the reasons for the increased safety level at roundabouts and we described the measures to be taken in order to accomplish an optimum roundabout safety and operational performance. We also described the differences between the single-lane and double-lane roundabouts conflict points when compared to the classic intersection one, and in the end, we concluded that roundabouts bring the simplicity of a "T" intersection to intersections with more than three legs. Another conclusion is that a four-leg single-lane roundabout has 75% fewer vehicle conflicts points - compared to a conventional intersection.* ***Keywords:*** *intersection, roundabout, safety, performance, capacity.*

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SMAT2008R11

ANALYSIS REGARDING THE PEDESTRIAN CONFLICT WITHIN ROUNDABOUTS

Ariadna ILIUȚ, Janos TIMAR, Corneliu COFARU

Abstract: *In this paper we presented the vehicle-pedestrian conflicts at signalized intersection and at single-lane roundabouts. In the second case, pedestrians face two conflicting vehicular movements on each approach, namely there are conflicts with the entering vehicles and other conflicts with the exiting vehicles. Also, we presented the bicycle conflicts and the general types of conflicts that occur in roundabouts. We finally stated the information access for blind or visually impaired pedestrians and presented solutions for them.* ***Keywords:*** *intersection, roundabout, safety, performance, capacity.*

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SMAT2008R12

EMISSION'S CONTROL FOR VEHICLES

Doina MIHON, Liviu MIHON

Abstract: *The aim of this paper is to take in consideration the need for policy instruments that can help our contry reduce the specific CO_2 emissions (per km) for new passenger cars. The analysis studies the agreement between the European Commission and the motor industry on CO_2 emissions from new cars. Europe may in future make use of high energy and carbon taxes or a limit and trade system that covers carbon emissions from all sectors of society.*

Keywords: *direct injection, multi-hole nozzle, spraying, homogenous mixture, smoke degree, nitrogen oxides.*

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SMAT2008R13

THE TIRES' PRINTS ON THE ROAD THAT MAY BE PROOFS DURING THE INVESTIGATION AND RECONSTRUCTION OF CAR ACCIDENTS

Alexandru PETRESCU, Marius TOMA, Stefan VOLOACA

Abstract: *The physical proofs that are the most used and analyzed in the case of car accidents are the prints left by the tires on the traffic lane or in its neighborhood. Considering the way they are obtained there are two trace groups: friction traces; traces made by printing. The tires must be examined to look for producing causes. This article shows every tire's feature (glide friction traces, slid friction traces, rolling trace) and if they were produced after or before the impact.*

Keywords: *tire, printing, slid, glide, rolling.*

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SMAT2008R14

THE EXAMINATION OF VEHICLE INVOLVED IN TRAFFIC ACCIDENTS THE EFFECT OF THE ACCIDENT ON THE VEHICLE INTERIOR

Alexandru PETRESCU, Marius TOMA, Stefan VOLOACA

Abstract*: In the majority of traffic accidents, the vehicles suffers damages of their components, results of violent action of factors who has their contribution to the foresee movement.*

This paper underlines the importance of correct stipulation of all accident's aspects. Must be observed all the lateral ceiling and under the car body deformations, the state of lightning lamps, wheels, interior of the vehicle (the seatbelts, airbags, the command elements on the control panel, biological prints, alcohol containers) and the state of big detach components. While the vehicle is under examination we must imagine how the accident and the damages did happen.

Keywords: *accident, motor vehicle, deformation, seatbelts.*

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SMAT2008R15

VEHICLE DYNAMIC BEHAVIOUR ANALISYS BASED ON GPS DATA

Ion PREDA, Dinu COVACIU, Gheorghe CIOLAN, Dragoş-Sorin DIMA

Abstract: *GPS technology has a wide spreading for the large public. Now, it has enough advantages to be considered as a useful tool in the research activity. The price and the easiness of use make that type of devices very interesting for the experimental study of terrestrial vehicle dynamics. The paper presents some GPS data processing possibilities figured out by the authors. Valuable information regarding the vehicle kinematic and dynamic behaviour can be obtained. The authors realised a computer program that run over the AutoCAD platform, valorising its geometrical and list processing capabilities. The data can be imported from different GPS devices using standardised or proprietary data formats. The information can be split, trimmed or merged for adjusting the track records to the researcher specific needs. Also, the results can be exported in some large accepted formats, to be used in spreadsheet applications as Excel or in mapping software as standard GPX file format. Starting from time and three-dimensional position data, the vehicle velocity, acceleration, road slope, movement resistance force or powers and engine load can be derived. These kind of results can be plotted in diagrams for easier interpretation in domains as traffic flow statistics, fuel consumption, energy recuperation and vehicle load estimation.*

Keywords: *vehicle dynamics, GPS, data acquisition, software tool, CAD programming.*

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SMAT2008R16

THE INFLUENCE OF THE PUBLIC ILLUMINATION ON THE ROAD EVENTS

Diana C. THIERHEIMER, Tiberiu NAGY, Nicolae TANE, Walter W. THIERHEIMER

Abstract: The natural and artificial lighting is the essential element of the road traffic in whose absence the participants' motion could not be possible. When natural lighting lacks, both the vehicle's artificial illumination and the external urban illumination facilitate, the maintenance of (the road traffic) the functioning of the system vehicle – road – pedestrian. This paper offers basic information on the visual guidance, which is a quality criterion with an essential role in ensuring a fluent and safe traffic. The manifestations of disability glare are given as examples, particularly in traffic. The paper also reveals a series of data that allow the establishment of the luminance level in the road-conflict area. Keywords: drivers' vision, natural and artificial lighting, disability glare, urban illumination, safe traffic

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MICROSCOPIC SIMULATION USING SIMTRAFFIC SOFTWARE

Janos TIMAR, Corneliu COFARU, Daniela FLOREA, Stelian ȚÂRULESCU, Dinu COVACIU

Abstract: *SimTraffic is a revolutionary development in the Traffic Engineering field. The program makes powerful simulation and animation easy and fast enough for everyone to use.*

SimTraffic is designed to model networks of signalized and unsignalized intersections, including roundabouts. The primary purpose of SimTraffic is to check and fine tune traffic signal operations. SimTraffic is especially useful for analyzing complex situations that are not easily modeled macroscopically. ***Keywords:*** *traffic simulation, urban mobility, sustainable transportation, traffic flow, efficient investigations*

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STUDY REGARDING THE ROAD TRAFFIC NOISE COMBINED WITH OTHER DISTURBING SOURCES

Janos TIMAR, Ariadna ILIUȚ, Corneliu COFARU, Daniela FLOREA, Călin ROŞCA

Abstract: *The urban traffic noise is a real problem of our days and it could be a very important disturbing factor. Combined with other sources, like ventilator or cooling systems - which were fixed on the exterior of the buildings and were not repaired in time-, could cause high level noise, bothering people living in the surrounding buildings.*

Keywords: *urban traffic noise pollution, traffic flows, urban mobility, sustainable transportation.*

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URBAN TRAFFIC DATA ACQUISITION USING THE GPS

Janos TIMAR, ARIADNA ILIUȚ, Corneliu COFARU, Daniela FLOREA, Sânziana TIMOFTI

Abstract: *The research paper intends to present a modern urban traffic data acquisition methodology. With the use of GPS SR 20 from* Leica, *the geometric determination of roads and buildings is more precise and it is easier to do it. After making the measurements from the chosen root, the data could be stored and digitized using Geo Office Soft. Having the data stored in an archive, could help other traffic simulation programs to make use of it. The data acquisition was made with the help of the students, who are writing their BA project.* ***Keywords:*** Data acquisition, GPS equipments, traffic flows*, urban mobility, efficient investigations*

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SMAT2008R20

INFLUENCE OF THE HUMAN ELEMENT OF THE INTERACTION BETWEEN USER AND THE ROAD

Iuliana LASCU, Daniel-Dragos TRUSCA

Abstract: *The physical road environment, road geometry and road equipment play an important role in the complex system of modern traffic. It applies not only to the planning, design, and construction of roads and streets, but also to the maintenance of the network. Furthermore it is important that immediate actions be taken to rectify hazardous locations whenever detected.*

Keywords: *accidents, human factor, road, environment, black spots.*

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SMAT2008R21

OVERVIEW OF VEHICLE TO PEDESTRIAN COLLISIONS IN LINEAR SETTLEMENTS AND THEIR CAUSES

Iuliana LASCU, George-Radu TOGANEL

Abstract: *This paper provides an overview of some elements as main causes for vehicle to pedestrian collisions linked to road transportation system for linear settlements in Romania. Some traffic, infrastructure and vehicle solutions are pointed out as feasible.*

Keywords: *automotive, pedestrian, collision, linear settlements, causes*

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SMAT2008R22

FAILURE TIME DISTRIBUTION ANALYZE OF THE BRAKING PADS IN ORDER TO OPTIMIZE THE PLANNED MAINTENANCE

Alexandru BOROIU, Viorel NICOLAE, Gheorghe STAN

Abstract: *This paper presents a study concerning the possibility to improve the planned maintenance program for the most frequent replaced spare parts of a motor-cars lot observed during the exploitation period: the front / rear braking pads. It is noticed that there is the possibility to introduce the operation of compulsory replacement of the braking pads that reached the third technical revision without be replaced, by sacrificing their exploitation resource, and so improving the motor-car availability, which is favourable for the owner.* ***Keywords:*** *failure time distribution, braking pads, planned maintenance.*

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SMAT2008R23

RESEARCH CONCERNING EXPERIMENTAL DETERMINATION OF THE MAIN PASSENGER FLOWS WITHIN THE METROPOLITAN AREA OF PITESTI CITY IN ORDER TO VALIDATE THE OPPORTUNITY OF INTRODUCING A NEW PUBLIC TRANSPORT SYSTEM ON INDIVIDUAL LANE (WHEEL TRAMWAY)

Rodica NICULESCU, Florian IVAN, Viorel NICOLAE, Catalin ZAHARIA

Abstract: *In the context of a main development of the Pitesti metropolitan area, it is necessary to optimize the passenger traffic in this area. This paper make a brief presentation of the stages of the opportunity study concerning implementation of a light passenger transport system with individual lane (wheel tramway) and describe the methodology for passenger flow determination in the main interest points concerning people mobility.* ***Keywords:*** *main passenger flows, public transport system, wheel tramway, opportunity study, people mobility.*

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SMAT2008R24

RESEARCH CONCERNING DETERMINATION OF COMMERCIAL SPEED IN ORDER TO VALIDATE THE OPPORTUNITY TO INTRODUCE A NEW PUBLIC TRANSPORT SYSTEM ON INDIVIDUAL LANE (WHEEL TRAMWAY) WITHIN THE METROPOLITAN AREA OF PITESTI CITY

Florian IVAN, Rodica NICULESCU, Viorel NICOLAE, Catalin ZAHARIA

Abstract: *In the first part of this paper it is defined the general concept of commercial speed, respective the average commercial speed, as a parameter of technical and economical analyze for a certain itinerary, within a public transport system by regulated duty. In the second part of the paper it is deployed a calculation model that emphasizes the interdependence between the values of this parameter and the particularities of road traffic within the analyzed itinerary. The calculation model was applied by authors to make the opportunity study for introducing a new public transport system on individual lane (wheel tramway) within the metropolitan area of Pitesti city..*

Keywords: *commercial speed, average commercial speed, road traffic, public transport system, wheel tramway.*

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SMAT2008R25

EXPERIMENTAL RESULTS OF THE IMPACT BETWEEN A FALSE-HEAD AND THE INSTRUMENT PANEL

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Abstract: *The paper presents the conception, design and construction processes of a test rig dedicated to the experimental study of the impact between a false-head and the instrument panel. Also, there are presented some experimental results and their comparison with a simulated test of the head impact with the instrument panel.*

Keywords: *instrument panel, head impact, ECE 21 Regulation, head deceleration, gravitational pendulum.*

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SMAT2008R26

THE APPLICATION OF SYSTEM'S IDENTIFICATION TYPE METHOD IN DESIGNING, REALIZATION AND VALIDATION OF MATHEMATICAL MODELS FOR TRAFFIC SEQUENCES OPTIMIZATION

Theodor George OPRICA, Traian POPESCU, Ilie DUMITRU, Constantin STAN, Nastase SUTRU

SUMMARY

The utlization of some algorithms for street traffic optimization constitutes the first and the most important step in realization of efficient management circulation systems.

The processes which take place in this domain are complex, relying on the aleatory element, the mathematical models can be elaborated basing on data and information taking only. The procedures used with this purpose can be allocated to the procedures known as system identification. In concordance to this type of procedures relying on data analysing and processing one can obtain theoretical statements which constitute the mathematical models searched for.

The autors have been concerned with street traffic optimization on local, but also regional areas, realizing researches, carrying out studies and buiding appropriate mathematical models.

For a component of the central street network of Craiova town, with the input parameters signal periods, fazes, crossing time periods, intersection's configuration, data about the traffic volumes, one can realize original mathematical models which allow the algorithmic approach of programming sequences in order to ensure maximun fluency and minimum pollution.

For models validation one resorted to the values of multiple correlation coefficient from the perspective of determinist connections.

KEY WORDS: urban trafic, optimization, mathematical model, procedure system identification

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RUTIERR TRANSPORTS, THEIR SUSTAINEBLE DEVELOPMENT AND ENVIRONMENT

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From thousands years, the man has tried to conquest the nature, but, unfortunately, the nature has not been adapted to man. This aphorism contains the essence between man and nature. [1]

The artificial pollution is the man activity into the struggle to conquest nature. Thus, for example, the green garden effect (caused of fuels burning, in main) has a great level of danger.