

## ABSTRACT MECHANICAL AND ELECTRICAL SCIENCE

**DANIEL APOSTOL (pg.83-85)**

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**THE INFLUENCE OF THE STATIC CONVERTOR ON THE ELECTRICAL CIRCUITS OF A DIESEL LOCOMOTIVE 060 DA**

**Abstract:** Some elements concerning the influence of the tension static converters functioning upon both the equipment and the 2100 HP railway engine power circuit are briefly presented in this piece of work. It aims, in particular, the behavior of a high power static converter used on diesel-electric locomotive electric train heating.

**Keywords:** locomotiva diesel-electrica, convertor static, chopper, inverter.

**REMUS BOBOESCU (pg.86-92)**

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**LINEAR MATHEMATICAL MODELS FOR WELDS IN LASER WELDING**

**Abstract.** It presents a study on the molten area produced at irradiation of steel plates with laser beam. A full factorial experimental design type  $2^3$  is used to evaluate the effects of power, welding speed and defocus (the distance between the focal plane and the surface of the piece). Parameters effects on the measured sizes for the weld cross section and the weld surface are presented by linear polynomial models. We discuss the variations presented by Pareto diagrams and response surfaces. It presents statistical analysis of the parameters effects by ANOVA method. It shows that the first effect on the analyzed sizes is given power. Identify the dynamic aspects of the welding process associated with keyhole welding regime.

**Keywords:** laser welding, weld cross section, full factorial design, welding pool.

**AURELIA CHIOIBAȘ (pg.93-97)**

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**REGARDING THE METHODS FOR DETERMINATION OF THE DEFORMATION LIMIT CURVES**

**Abstract:** The deformation limit curves show the dependence between the two real main strains or the two logarithmic strains which arise in the plane of the deformed blank by stretching or drawing. According to the criterion used for limiting the deformation it will result the deformation limit curves either for the nick or for the break. The determination of these curves allows the removal of the danger of breaking the pieces at working by drawing.

**Keywords:** deformation limit curves, the shape of the punch, the shape of the blank, the maxim and minim strain

**VERGIL CHIȚAC, MIHAIL PRICOP, TIBERIU PAZARA, VALENTIN ONCICA, FLORIN GHEORGHE (pg.98-103)**

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**UNDERWATER NOISE AND THE NAVAL TRAFFIC FROM THE ROMANIAN BLACK SEA COAST AREA**

**Abstract:** The Romanian Black Sea coast is an area with intense human activity, but also is an area with a large number of marine species. The regular measurement of the level of underwater noise is an important task in order to observe the evolution of the influence of human activities over the marine species. For a year and half, a team of professors from the Naval Academy „Mircea cel Batran“ and Ovidius University conducted a series of experiments regarding underwater noise. In this paper, a part of the results and conclusions are presented.

**Keywords:** Underwater noise, ship, fish

**DUMITRU DASCĂLU, MIHAIL PRICOP, DRĂGUȚA DASCĂLU (pg.104-108)**

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**THE TYPES OF SHORE MEET WHILE OPERATING WITH SPECIAL DISASTER DEVELOPED BOAT**

**Abstract:** This paper present a analyze of different type of shore while operating with special disaster developed boat, designing the access ramp for people, animals or deferent vehicles.

**Key words:** special boat, disaster, access, shore.

**DUMITRU DELEANU (pg.109-117)**

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**DYNAMIC LYAPUNOV INDICATOR: A PRACTICAL TOOL FOR DISTINGUISHING BETWEEN ORDERED AND CHAOTIC ORBITS IN CONTINUOUS DYNAMICAL SYSTEMS**

**Abstract:** In the present work our goal was to verify if the Dynamic Lyapunov Indicator (DLI), proposed recently by Saha and Budhraja as a new tool for distinguishing between ordered and chaotic orbits, gives correct conclusions when is applied to continuous dynamical systems. The behavior of certain continuous dynamical systems, like Ueda oscillator, Rossler oscillator, Rucklidge oscillator and Thomas oscillator has been studied and conclusions regarded DLI for ordered/chaotic orbits has been considered. The simplicity of the idea and the correlation between the conclusions obtained by DLI and other tools, show that DLI is a very consistent indicator in identifying ordered/chaotic orbits in continuous dynamical systems.

**Keywords:** indicator of chaos, continuous dynamical systems

**LUCIAN TEODOR GRIGORIE, MIHAI LUNGU, IOANA RALUCA EDU, RADU OBREJA (pg.118-125)**

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**A TOOL FOR THE AIRCRAFTS ATTITUDE DETERMINATION**

**Abstract:** The paper presents a Matlab implemented tool used to calculate the attitude angles of an aircraft starting from the strap-down gyros readings. The tool uses a dedicated method for the numerical integration of the quaternionic Poisson equation and allows the custom selection of one of the first six orders of the numerical method. In a first phase, the theoretical background of the attitude determination is shown, and the equations to be implemented are extracted in discretized form. Further, the obtained tool is shortly described. Subsequently, the validation of the tool is performed. Firstly, a numerical simulation validation step is achieved; finally, an experimental validation step is used to evaluate the tool performances. The obtained tool can be used booth in numerical simulation of a strap-down inertial navigation system, but also in an aircraft post-flight debriefing stage to evaluate the roll, pitch, and yaw attitude angles.

**Keywords:** strap-down inertial navigation, attitude tool, quaternionic method, numerical simulation, experimental validation.

**GEORGIANA MARIN, GHEORGHE SAMOILESCU, SERGHEI RADU (pg.126-129)**

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**PREDICTION OF SHIP MAGNETIC SIGNATURES THROUGH SEMI-EMPIRICAL METHODS**

**Abstract** - The issue of assessing and reducing the ship's magnetic signatures, particularly the ones generated by the ferromagnetic materials within its structure, has long been studied through various means, starting from experimental measurements to applying complex mathematical methods. This paper proposes a semi-empirical method which correlates a set of magnetic field measurements with the mathematical model of an equivalent source in order to attain a complete image of the ship's magnetic field distribution and therefore define the danger area outside the ship's hull which would influence the magnetic mines or the surveillance systems.

**Keywords:** magnetic signature, modeling, ship magnetism

**CORNELIU MOROIANU (pg.130-132)**

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**THE PRODUCTION OF WATER-RESIDUAL HEAVY FUEL EMULSIONS BY ULTRASOUNDS**

**Abstract:** Nitrogen oxides are known to be immediately dangerous to human and environmental health. Mobile and stationary diesel and residual fuel engines are contributing largely to the worldwide NO<sub>x</sub> emissions. Emulsification of the fuel with water is a way to reduce the NO<sub>x</sub> emissions of engines. The ultrasonic emulsification is an effective means for generating fine-size fuel/water-emulsions. This paper presents a possibility of producing the water-heavy fuel emulsions by means of ultrasounds.

**Keywords:** emulsion, ultrasonic vibration, NO<sub>x</sub> emissions, heavy fuel emulsions.

**TIBERIU PAZARA, GEORGE NOVAC, MARIAN ILINCUT (pg.133-137)**

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**THE IDENTIFICATION OF THE CAUSES FOR THE FAULTY RUNNING OF NAVAL DIESEL GENERATORS**

**Abstract:** Onboard ships, diesel generators represent one of the main sources of noise and vibration. For a proper functioning and to transmit lesser vibrations to ship's hull, the generators are mounted on dampers. In this paper are analyzed the results of the measurements conducted onboard training-ship Mircea during a march on the Black Sea. The generators worked under various operating conditions, thus led to determine the critical vibrations. Finally, after the analysis a few recommendations and solutions were made.

**Key words:** Diesel generators, vibrations, dampers

**RADU SERGHEI, SAMOILESCU GHEORGHE (pg.138-140)**

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**MODERN METHODS USED IN PROTECTION OF ELECTRICAL NETWORKS ON MERCHANT SHIPS**

**Abstract:** Essential feature of electrical installations on ships is complexity. Today, a ship no matter how small it is inconceivable without an electrical installation. Each ship has to carry with it its own power source. On the ship there is a power distribution network, power consumers of various types, lighting, heating, household facilities, signal installations and automation of various mechanisms and devices, radio/satellite communications installations and other special-purpose electrical equipments (demagnetization installation, installation of cathodic protection, installation of signalling radioactivity, anti-rolling stabilizers plant, etc.).[1].

This complexity of electrical installations on ships required for their construction and operation of a large number of specialists. In shipyards and in research and design institutes is possible specialization by type of equipment. On board ship, where there is few staff, officer must know all electromechanical problems proper functioning of the electrical system on board.[2].

Electrical equipment protections are designed to limit the effects of failure/emergency mode, to protect the electrical equipment and electrical generators and consumers. Protective devices must notify the occurrence of abnormal mode of operation and to isolate the damage sequence by switching devices. To be effective protection must to be sensitive, rapid, selective and more reliable.[1].

**CONSTANTIN STRÎMBU, CRISTIAN-GEORGE CONSTANTINESCU, MARIAN PEARSICĂ, ȘTEFAN NEDELCU (pg.141-149)**

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**ABOUT POWER CONSUMPTIONS DETERMINATION OF THE TRANSFORMER IN A.C. SWITCHING MODE**

**Abstract:** This paper introduces least square method based algorithms to obtain the apparent power of the RC loaded transformers operating in a.c. switching mode (the switch is connected in the secondary). In technical literature there is a lack of information concerning the main input data for designing a transformer (the primary, S<sub>1</sub> and secondary, S<sub>2</sub> apparent voltamps). These items are determined as two variable (load circuit and thyristor firing angle) polynomial functions, obtained by using a multiple regression procedure (least squares method based). This function is obtained starting from the results returned by the study of the non-linear transformer model.

**Keywords:** apparent power, least squares method, multiple regression

**LIVIU CONSTANTIN STAN (pg.150-154)**

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**MODEL SIMULATION OF HIGH POWER DIESEL ENGINE EXHAUST GAS POLLUTANTS**

**Abstract:** This paper tried to simulate the combustion inside the marine diesel engine using the newest computer methods and technologies with the result of a diverse and rich palette of solutions, extremely useful for the study and prediction of complex phenomena of the fuel combustion.

**Keywords:** high power marine diesel engine, combustion, finite element analysis, chemical reaction, non-premixed constituents, multiple species

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(pg.155-161)

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**THE ENGINE THERMAL BALANCE. DETERMINATION OF ENERGY QUANTITY NECESSARY FOR COOLING A NAVAL ENGINE**

**Abstract:** *The cooling process has a great influence on the dynamic, economic and durability performance of an engine. In the present paper are presented in the first part some theoretical aspects linked by the cooling installation of the engine and the thermal balance; this are preceded in the second part by an calculus example for the determination of energy quantity necessary for cooling a naval engine choused arbitrary, using his technical documentation.*

**Keywords:** *thermal balance, energy quantity, cooling.*