

**ABSTRACT**  
**NAUTICAL AND MANAGEMENT SCIENCE**

**DINU ATODIRESEI, ALEXANDRU COTORCEA, ALEXANDRU SERBAN, EMIL DUMITRELE**

Naval Academy, Constanta, Romania

**ASSESSMENT OF THE WIND POTENTIAL FOR THE NORTH-WESTERN AREA OF THE BLACK SEA BY INTERPRETING DATA RECORDED BY METEOROLOGICAL SATELLITES AND METEOROLOGICAL COSTAL STATIONS AND THE EXPLOITATION OF THIS INFORMATION BY VESSELS ENGAGED ON COASTAL ROUTES**

**Abstract:** *The subject of this paper is to assess the wind potential for the north-western area of the Black Sea based on satellite recorded data supplied by "ASCAT" (Advanced SCATterometer) and from meteorological costal stations for the purpose of utilizing this data onboard commercial ships in order to efficiently produce renewable energy. The evaluation of the benefits obtained by capitalizing wind power, thus producing renewable energy using contemporary technical solutions already existing within the maritime industry, has been achieved by comparing energy production costs between onboard diesel generators and wind turbines across various types of ships.*

**DINU ATODIRESEI, ANDREI BAUTU, ALECU TOMA, ANDREI POCORA, IONUT BRANICI**

Naval Academy, Constanta, Romania

**USING JAVA PROGRAMMING LANGUAGE TO CODIFY/DECODIFY HYDROMETEOROLOGICAL MESSAGES FROM SHIP CODE ABOARD VESSELS AND WRITING OF PARAMETERS USING BJERKNES SCHEME**

**Abstract:** *With the help of Java programming language, a software for conversion of hydrometeorological parameters received by vessels, buoys and shore stations in SHIP code. These informations are further plotted around the shore station using Bjerknnes scheme. The software can also be used the other way around, in encoding own measurements and transmitting them to regional forecast stations, according to requirements implied by shipping companies or Naval Forces.*

**ROMEO BOSNEAGU**

Naval Academy, Constanta, Romania

**GPS VERSUS ELORAN**

**Abstract:** *The purposes of today's radionavigation systems converge; they aim to maintain and improve the three fundamental qualitative parameters of the positioning process: precision; availability; integrity. Still oscillating, the position of the greatest positioning users seem to have convergent pathways, yet in their vision, future belongs to global satellite navigation systems, doubled by the services of the Loran-C system, and starting with the second decade of the twenty-first century by e-Loran*

**CARMEN LUMINITA COJOCARU**

Naval Academy, Constanta, Romania

**THE PERSONALITY OF THE NAVAL LEADER - A STRUCTURED COMPLEX**

**Abstract:** *The study aims to analyze the personality of the navy leader from the perspective of a hyper-complex, probabilistic, open system, highly influenced by their profession and the specific of their activities at sea. We have tried to capture as much as possible, the relations of interaction, the inter-influence, compensation, and feedback placed among the components of personality.*

*It also observes the way in which the personality system tends toward successive balancing and rebalancing under the influence of external disturbance stimuli.*

*The study pleads for the growth of the leader through training, personal development, teamwork experience, interpersonal perceptions with minimal errors, both through well-being and through personal and professional efficiency; the paper also pleads for maximization of the effectiveness of naval leadership.*

**CARMEN LUMINITA COJOCARU**

Naval Academy, Constanta, Romania

**NAVAL OPERATIONAL LEADERSHIP AND EMOTIONAL INTELLIGENCE**

**Abstract :** *The study aims to analyze the conceptual boundaries of the two concepts operational leadership and emotional intelligence in terms of their coincidence in understanding the opposition of the following terms: part – whole, proximate kind/ type- specific difference, and their complementarity and integration into*

*a mixed model of naval operational leadership, having as essential variable the emotional intelligence – a special skill of any leader.*

*The findings of the theoretical and methodological analysis have major implications for the practical naval domain, i.e. for building excellence in leadership, for systematic training, so as to develop emotional intelligence, which would implicitly lead to increased safety and efficiency of the missions in the naval field.*

**ABDI KUKNER, SERTAC BULUT, AKILE NESE HALILBESE**

Istanbul Technical University, Turkey

**RENEWABLE ENERGY OPTIONS AND AN ASSESSMENT OF WIND-BASED PROPULSION SYSTEMS FOR SMALL CRAFTS**

**Abstract:** *Increasing fuel prices and strong environmental concerns have changed the competitive landscape of the shipping industry today. The conventional propellers are still commonly used for marine propulsion, but the alternative propulsion systems become more prevalent, their advantages do as well. Because the environmental regulations for shipping are getting stricter, the marine propulsion systems based on renewable energy have recently received a large amount of attention. General strategies for reducing the small crafts dependence on oil for transportation include reducing energy use on the propulsion systems. In this respect, wind-assisted propulsion systems offer considerable options for introducing renewable power into shipping. The wind assisted systems generate thrust from the wind and thereby reduce dependence on fossil fuel and main engine operation. In this paper, alternative propulsion systems such as kite-assisted propulsion, Flettner rotor, and wind turbine systems and their applications to the small crafts have been investigated. Moreover, the working principles of each system have been analyzed in detail and compared in terms of their advantages. A detailed description of the systems had been explained how to obtain the daily energy to be needed and usage in yacht by harnessing renewable energy from the wind.*

**SERGIU LUPU, ANDREI POCORA, ROMEO BOSNEAGU, COSMIN KATONA**

Naval Academy, Constanta, Romania

**THE SECURITY AND SAFETY OF MARITIME NAVIGATION THROUGH ROMANIAN MARITIME HARBORS**

**Abstract:** *In changing times the design and build of ships has altered and the needs of the professional sailor must be adapted to meet the requirements of these modern times. The practical seaman must adapt alongside a developing hi-tech industry and be able to improve when the need arises. The increasing of the capacity of commercial ships produced a depth boundary of many ports and harbors. Constanta harbor along with the two satellite harbors, Midia and Mangalia, is at the crossroads of trade routes linking landlocked country markets of Central and Eastern Europe in the Transcaucasus region, Central Asia and the Far East. The security and safety of navigation in the western Black Sea is in the care of civil and military departments with clearly defined prerogatives. Romanian Naval Authority through Constanta Vessel Traffic Service (VTS) supervises the coordination and control of navigation in roadstead and maritime docks by providing navigation guidance with seven lighthouses, one radio-marker, three entrance lights, three flashers and four fog signals. This paper aims to present how the safety and security in maritime navigation on the Romanian borders and new improvements is currently assured by using an autonomous underwater vehicle (AUV). Thus, such a device could be used to monitor the seabed, to determine the hydro-acoustic diver fingerprint, underwater vehicles and surface vessels.*

**ANDRA NEDELICU, ALECU TOMA**

Naval Academy, Constanta, Romania

**CALCULATION OF DRAG FORCE OF TYPE 22 FRIGATE USING PTC MATHCAD PROGRAM**

**Abstract:** *One of the basic problems of design, construction and operation of the ship is about ensuring the evolutionary qualities. This qualities depend largely on hydro and aerodynamic forces acting on the ship's body and its movement which oppose.*

*The theme of the study is to calculate the drag force of a ship caused by the waves, the wind, and also the ship towing power calculation, power efficiency propeller, and propeller machine. The specific characteristics of the ship belong to frigates class type 22. The calculation for case study was executed in Mathcad program.*

**VALENTIN ONCICA, ALECU TOMA, IONUT-CRISTIAN SCURTU**

Naval Academy, Constanta, Romania

**CONSIDERATIONS ON THE CALCULATION OF THE MAIN CHARACTERISTICS OF THE SHIP  
SEAKEEPING**

**Abstract:** *The motion of a ship or floating structure is important for determining of the dynamic load on the crew/ passengers, structural materials and equipment, and cargo. In this paper we propose to determine the parameters that influence heaving and pitching amplitude relevant to study the 97,000 dwt bulk carrier. With equations based on regression analysis can be estimated amplitude values for various degrees of sea agitation and for various loading situations of the ship. The results are useful for determining additional loads induced both structural elements and the components of equipment and installations on board ships.*

**LAVINIA GEORGIANA PASCU, ALECU TOMA, IONUT GEORGIAN ZAMAN**

Navy Application School, Mangalia, România, Naval Academy, Constanta, Romania

**RISK MANAGEMENT OF FLOODING IN THE ROMANIAN SECTOR OF THE DANUBE**

**Abstract** *Flooding is threatening many millions of people in Europe. It is the most widely distributed of all natural hazards across Europe with floods from rivers, estuaries, and the sea. Floods, wherever they happen, cause distress and damage. The data from insurance company shows that the financial impact of flooding has increased significantly since 1990. The present paper aims to study the high - risk flood areas on the Romanian Danube.*

**ANDREI POCORA, SERGIU LUPU, ALECU TOMA, COSMIN KATONA**

Naval Academy, Constanta, Romania, University Politehnica, Bucharest, Romania

**LIGHT POLLUTION IN CONSTANTA: A CASE STUDY**

**Abstract:** *Light pollution, also known as luminous pollution or photopollution, is the result of inefficient, misdirected or excessive artificial light and can cause a series of problems. Being a side effect of industrial civilization, its sources include urban lightening, advertising LED panels, streetlights, mainly all sorts of artificial illumination. The main consequences of light pollution include energy waste, security problems, health problems, disruption of ecosystems and negative effects on astronomy. More artificial light means an increased sky glow, thus fewer stars are visible on the night sky. Being a real threat to our ecosystem, various organizations started monitoring light pollution and began researching different ways to reduce its impact on Earth.*

*The worldwide light pollution map is still in a continuous developing state and from that point of view Romania could have a great potential to carry out new maps for the young astronomical associations. Starting with 2015 “Mircea cel Batran” Naval Academy is endowed with a Sky Quality Meter, a professional tool used to measure light pollution. Various measurements were taken on site with this tool, and a database was created. This paper is a case study on light pollution in Constanta city and aims to find the best places for astronomical observations.*

**IULIUS LIVIU RUSU**

The Bucharest University of Economic Studies

**DEVELOPMENT STRATEGY FOR THE TRAFFIC OF GOODS IN THE CONSTANTA HARBOR**

**Abstract:** *The shipping industry has become a professional environment that for performance targets proposed are forced to govern a flexible amount of effects of external factors not always friendly. The essential element of performing is competitive advantage created in the market by a management structure following a strategy that seeks safely profit as primary objective and environmental protection. The develop business strategies of shipping companies have as main element understanding of critical success factors for each segment managerial function. Strategies for development of harbor Romanian infrastructure as development strategies for domestic shipping companies are developed taking into account the projections of economic and geopolitical medium term of the Black Sea, the Mediterranean, Central and Eastern Europe in particular the countries bordering the Danube river and the Transcaucasian region in accordance with international environmental protection and decrease pollution correlated with performance and development indicators.*

**IULIUS LIVIU RUSU**

The Bucharest University of Economic Studies

**ECONOMIC VALORISATION OF THE SHIP IN GLOBALIZED CIRCUMSTANCES**

**Abstract:** *Economic recovery of the ship or fleet is made through shipping activity in which all specific activity resources are efficiently used, to obtain profit, while performing tasks transportation. This activity is closely related to economic phenomena that directly or indirectly affect the trade. European shipping in the context of globalized markets and increased competitive pressure, is the target of ship-owners strategies to increase competitive advantage in shipping markets.*

**IONUT-CRISTIAN SCURTU, ADRIAN POPA, MARIAN RISTEA, DANIEL MARASESCU**

Naval Academy, Constanta

**RESEARCH ON HEAVE PLATE EFFECT ON VERTICAL COLUMN MOTION**

**Abstract:** *Difficulties in 3D models simulation related to large number of cells and nodes lead to higher hardware requirements and large sets of equations for solving VoF model in CFX solver. To simplify the computational load we will use only one column vertical cross section because the vertical motion will determine effect of heave plates due to increased additional mass. Simplified Computational Fluid Dynamics(CFD) lead to fast simulation results and realistic vertical motion analysis. The column is fitted with heave plate and during the vertical motion simulation the angle of incidence between freesurface and column will be modified as a set parameter. Based on Ansys CFX software and VoF method the column will be submerged in saltwater and released with an excess of buoyancy equivalent to 0,4 meters movement of COG. Graphical results are presented for simulated situations and all results show*

**PETRU SERGIU SERBAN**

Naval Academy, Constanta

**NUMERICAL SIMULATION OF SHALLOW WATERS EFFECTS ON SAILING SHIP "MIRCEA" HULL**

**Abstract:** *CFD techniques for studying the influence of hydrodynamic forces on ships are increasingly used in the maritime community, including the study of ship to bank, ship to ship and ship to bottom interaction in shallow waters. The paper aims to the process and selection of appropriate methods for creating the geometry, mathematical model setup and simulation using Ansys CFD CFX program. CFD simulations were conducted to observe the effects of limited depth on sailing ship "Mircea" hull in two domains, one with a depth of 20.35 m and the other with a depth 6.85 m.*

**OCTAVIAN TARABUTA, GHEORGHE ICHIMOAEI, CATALIN-PAUL CLINCI, AUREL GHERGHINA**

Naval Academy, Constanta

**BIOMIMETIC CONTROL OF AUTONOMOUS UNDERWATER VEHICLES: A MODELLING ALGORITHM FOR COMPUTING THE CURRENT SWAY**

**Abstract:** *The sway produced by the sea currents on autonomous underwater vehicles (AUV) is an unpredictable variable that impedes them to follow a straight course, as desired. In order to correct these errors, the authors previously proposed a biomimetic approach of control, by determining the influences of sea currents through an array of pressure sensors on both sides of the AUV, resembling a fish's lateral line. The values of the incidences and intensities of the current pushing the AUV can be measured by the lateral line array as differences in the pressures of two corresponding points on both sides of the AUV. Subsequently, the micro-controller in charge with motion control has to correct the disturbed trajectory after analyzing the input error. This paper describes an algorithm for transforming the pressure differences from the sensors to empirical mathematical equations that can describe the current parameters, thus allowing the controller to command the proper corrective action to the propulsion motors.*

**ALECU TOMA, VALENTIN ONCICA, DINU ATODIRESEI**

Naval Academy, Constanta

**THE STUDY OF SHIPS BEHAVIOR DURING PORT MANEUVERING WITH TUGS**

**Abstract:** *Most of the time, during the turning, the motion of the ship is not a perfect circle because there are several forces acting on the ship and these forces change continuously. In this paper we study the real motion of the ship when a transverse force is applied by a tug at the different points of the moving or stationary ship. The pivot point is useful by seafarers to visualise the rotation of a ship during its combined rotation/translation movement. It is the result of all forces acting on the ship and its position changes continuously during the ship's displacement, depending on the forces involved. The centre of drift is the point at which the resultant of all hydrodynamic forces acts: underwater resistance, lift and drag as a function of speed and drift angle. The underwater resistance force exists both for pure headway or sternway motion and for all lateral motions. It induces flow velocities below and beside the hull. On a real turning circle the heading*

*is not completely constant as it undergoes small variations due to small changes in the forces acting on the ship: local variations in water depth, variations in distance from the shore line, local currents or wind gusts.*

**VALENTIN S. VASILEV**

"Nikola Vaptsarov" Naval Academy, Varna

**SOME SPECIFICS OF REDUCING THE IED RISK IN OFFSHORE SECURITY ENVIRONMENT**

**Abstract:** *Improvised Explosive Devices (IED) undoubtedly pose significant threat to all spectrums of offshore constructions. It is necessary, security of offshore industry to be prepared to withstand against harmful impacts caused in asymmetric way - unclearly defined motivation during selection of targets and usage of improvised devices in order to materialize damage. Effects are more than undesirable such as having an effect on moral of personnel or economic status of company. Oil spills should be considered as main objective or, at least, as an imminent aftereffect realized by IED-attack.*

**IONUT GEORGIAN ZAMAN, ALECU TOMA, LAVINIA GEORGIANA PASCU**

Navy Application School, Mangalia, Romania, Naval Academy, Constanta

**THE INFLUENCE OF SQUAT ON THE MANEUVERABILITY OF "MUSCA" CLASS MINESWEEPER**

**Abstract:** *The squat effect, defined as the reducing the distances between keel and seabed because of hydrodynamic phenomenon, appears when a vessel is moving through shallow water. Small under keel clearances can cause important sinking and higher risks of bottom collision. In this paper we developed a computer software package for squat calculation using "Visual Studio Express Edition" that offers a quick calculation, efficiently and accurately. We study regarding forces acting on the body of the "MUSCA" Class Minesweeper when squat effect occurs. We made two simulations that show the forces acting over the body of the ship and how it reacts in shallow water. We considered two working speeds, the march speed of the ship and the sweeping speed. We analyze the squat influence on the evolutionary qualities of the "MUSCA" Class Minesweeper.*