

РЕФЕРАТИ АНГЛІЙСЬКОЮ МОВОЮ

UDC 519.87:629.056.8(045)

¹V. Kharchenko, ²A. Kukush, ³E. Znakovska**MATHEMATICAL MODEL FOR IDENTIFICATION OF CONSTELLATION OF NAVIGATING SATELLITES GPS, GLONASS, GALILEO**^{1,3}National Aviation University²Kyiv National University of Taras Shevchenko¹E-mail: kharch@nau.edu.ua²E-mail: alexander_kukush@univ.kiev.ua³E-mail: zea@nau.edu.ua

In this article the upgraded mathematical model for identification of constellation of navigating satellites GPS, GLONASS and GALILEO is presented. This model may be used for more adequate aeronavigation means integrity definition.

Keywords: air navigating system, coordinates, integrity, navigating satellite, pseudo-range.

UDC 621.396:621.396.933:629.783:621.396.946

¹V. Kharchenko, ²Yu. Barabanov, ³A. Grekhov**MODELING OF SATELLITE CHANNEL FOR TRANSMISSION OF ADS-B MESSAGES**

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The model of communication channel “aircraft – satellite – ground station” was built and used for modeling of ADS-B messages transmission with the help low-orbit satellite complex Iridium. Dependences of Bit Error Rate on type of signal modulation, losses on a line, diameter of antennas, nonlinearity of high power amplifier and satellite repeater gain and received.

Keywords: Bit Error Rate, diameter of antennas, model of communication channel “aircraft – satellite – ground station”, nonlinearity of high power amplifier, rate of information transmission, satellite communication channel, signal power, type of signal modulation.

UDC 62.91

¹V. Chepizhenko, ²V. Pavlov, ³S. Pavlova**VIRTUAL EINSTEINIAN FORCE FIELDS IN THE SYNERGY OF NAVIGATING SPACE OF DIFFICULT ERGATIC SYSTEMS**^{1,3}National Aviation University²International Scientific-Educational Center of Information Technologies and Systems,
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In the article the analysis of modern directions of navigating spaces development of complex ergatic systems has been carried out, their transformation tendencies of structural and functional levels have been shown. Limitations of modern methods of the conflicts resolution of difficult dynamic systems have been exposed. For the conflicts resolution in environments of type CNS/ATM it has been offered to use the natural-scientific system approach. This approach contains full group virtual of navigating space symmetries, ergatic systems organization laws (functional and technological homeostasis), and also operation laws of complex technical systems. Control levels of conflicting dynamic objects have been formalized.

Keywords: CNS/ATM environment, difficult system, homeostasis, force field, synergetics, the concept “Free flight”.

UDC 629.735.072.8.08:681.3(045)

V. Gorbunov**THE ARTIFICIAL IMITATOR OF PSYCHOTROPIC SIGNS OF FLIGHT ACCIDENT – ERGONOMIC ASPECT OF SIMULATOR TRAINING**

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Simulator training of the crew is a kind of modern aviation technology to ensure flight safety. The ergonomic aspect of this technology is to increase the emotional stability of the crew under stressful conditions of real flight refusal situation. Its implementation is possible by modeling the effect of psychotropic signs of the flight accident on the crew when they failed the task on simulator. Such a “procedural punishment” causes pilot’s increased emotional tension, which hinders to performance his professional duties with high quality in real flight. At the same time on the simulator this tension promotes the acquisition of practical skills to preserve an acceptable emotional condition, due to psychological overcoming the emotional stress. As a result the pilot maintains high professional ability to eliminate the dangerous consequences of an emergency successfully. In this connection the artificial imitator of psychotropic signs of the flight accident as a “pedagogical means” for ergonomic improving the flight safety has to be “methodical and technical” component of any flight simulator, to improve the quality of simulator training of the crew and flight safety in general in terms of human factor.

Keywords: aircraft simulator, flight safety, human factor, simulator training, the artificial imitator of psychotropic signs of flight accident.

UDC 551.508.822+621.396.67

¹V. Chygin, ²O. Krasnyuk, ³V. Smychok**SYSTEM FOR VISUALIZATION OF TRAJEKTORY OF METEOROLOGICAL BALLOON-RADIOSONDES**^{1,2}Land Forces Academy named after Petro Sahaidachny³Lviv Regional Hydrometeorology Center for MES of Ukraine^{1,2}E-mail: vchygin@gmail.com

The system for three-dimensional visualization of flight trajektory of meteorological balloon-radiosondes in real time to improve the safety of military and civil aviation flights. The basis of STV is the modernization of existing radar using computer technology. It is shown that the measuring resolution of the height of ball-probe using the STV is 6 m, while the existing meteorological radars provide 160 m. The STV allows to set the distance to the ball-probe with an accuracy of 10 m at a distance of 300 km.

Keywords: flight trajectory, meteorological radiosonde, safety of aircraft flight.

UDC 656.71.057:621.31(045)

¹V. Kazak, ²L. Novachuk**SYNTHESIS OF MULTI-CHANNEL SYSTEM OF ELECTRIC POWER IN THE UNFAVORABLE SITUATIONS**

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Analysis of modern electric power of light signaling complex of aerodrome is conducted. Synthesis of parametric identification of multi-channel systems of electric power in unfavorable situations is conducted and variable does not change in time interval of observation, is a sequence of independent at each step of unfavorable variables, is a Markov chain.

Keywords: electrical power system, light signaling complex of aerodrome, multi-channel system.

UDC 629.735.33–519:621.383.51(045)

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UNMANNED AERIAL VEHICLE WITH SOLAR ENERGY SYSTEM SYNTHESIS

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The main scopes of unmanned aerial vehicles are considered. Major current publications analysis on the aircraft development using photovoltaic cell is conducted. Typical unmanned aerial vehicle and his basic parameters are analyzed and defined. The example of power value calculations that provide straightly horizontal flight and steady lifting of typical unmanned aerial vehicle are conducted. Photovoltaic cells and batteries necessary weight and electrical characteristics are defined.

Keywords: electric engine, photovoltaic cell, typical unmanned aerial vehicle.

UDC 656.7.081(477):339.924(045)

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INTEGRATION EXTENT OF UKRAINE IN INTERNATIONAL MULTI-LAYER FLIGHT SAFETY CONTROL SYSTEM

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Flight Safety is one of the main areas of civil aviation. Orderly approach to flight safety provision, including necessary organizational structures, sphere of responsibility, policy and procedures represents a multi-layer System for Flight Safety Control (SFSC). Ukraine, as aviation country, to a certain extent is already integrated into all the SFSC levels, but the question remains open – how deep this integration is accomplished, and also problems that impede it. By means of analysis for each of the levels, it was shown that more deep integration is made on low levels, but the higher levels did not demonstrate such tendency. The situation can be corrected by more clear and coordinated reforms directed to cooperation with European agencies in the field of flight safety provision.

Keywords: civil aviation, flight safety, Flight Safety Control System, ICAO, State regulation of civil aviation of Ukraine.

UDC 656.7.05;351.814.2(045)

¹Yu. Chynchenko, ²S. Polishchyk

SOFTWARE FOR MODELLING OF PROCESSES OF FLIGHT OPERATION IN AREA OF AERODROME

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Information about theoretical aspects of development of interactive system of provision of guaranteed level of safety of air traffic in aerodrome zone is provided. Set of software products for modelling of processes of flight operation in area of aerodrome is considered.

Keywords: aeronautical system, air traffic management, , assessment of hazards and risks, interactive system of provision of guaranteed level of safety of air traffic in aerodrome zonesafety of flights, software.

UDC 629.3.025.2(045)

O. Sushchenko**RESEARCH OF H_∞ -METHODS FOR STABILIZATION OF INFORMATION-MEASURING DEVICES**National Aviation University
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The paper is devoted to research of the modern methods for the wide class control systems robust controllers H_∞ -synthesis. The classification of these methods was defined in the paper. The comparative analysis of their possibilities for information-measuring stabilization systems design was carried out. The research results are of interest of the field of the information-measuring stabilization systems assigned for exploitation at the vehicles of the wide class.

Keywords: H_∞ -synthesis, information-measuring devices, mixed sensitivity, pre- and post-compensator, stabilization systems.

UDC 621.391.83:629.783(043.2)

A. Sushych**SECONDARY PROCESSING OF GLOBAL NAVIGATION SATELLITE SYSTEMS NAVIGATION DATA**National Aviation University
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The concept of digital filtering of experimental data received from navigational sensors according to Global Navigation Satellite Systems user requirements is considered. Experimental results of secondary dithering of the user location assessments using modern navigation equipment and the original software are received.

Keywords: Global Navigation Satellite Systems, Kalman's filter, navigation data, secondary processing.

UDC 656.7.052;656.7.071.13(045)

¹O. Luppо, ²O. Hlushko, ³D. Dolmatova**DETERMINATION OF ACC SECTORS CAPACITY BY THE EUROCONTROL METHODOLOGY**

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The article deals with the main characteristics and perspectives of Eurocontrol methods for the determination of ACC capacity, was considered the ATC Capacity Analyzer tool (CAPAN), and fast ACC capacity evaluation tool (FACET), was studied the reorganized ATC mathematical simulator (RAMS).

Keywords: reorganized ATC mathematical simulator, sectors capacity, simulator tools.

UDC 629.735.072.8.08:681.3(045)

N. Apenko**STATE AND PROSPECTS OF AIRCRAFT FLIGHT SIMULATORS BUILDING**National Aviation University
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Preparing astronauts, pilots, operators of complex systems on a live plant requires significant public expenditure. The alternative is to create air simulators and aircraft simulators, which are as much as possible close to existing facilities and allow those who are going through training to acquire stable skills piloting the corresponding objects.

The use of simulators increases security in the preparation of pilots, leading to fuel savings and reduces pollution. The development of new domestic airline simulators, in turn, must rely on international experience in this area. Conduct a comprehensive analysis of the international status of this issue will draw on this time of experience in the further development of domestic aircraft simulators with enhanced capabilities of visualization systems and will contribute to saving the state to train personnel and increase its defense power as a whole.

Keyword: air simulator, aircraft simulator, visualization system

UDC 004.032.6(045)

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CROSSPLATFORM TECHNOLOGY OF DIGITAL STREAMING VIDEO PROCESSING BASED ON LOCAL LINEAR OPERATORS

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Presented Shader information technology of real time processing streaming video based on Adobe AIR and Pixel Bender. Information technology algorithms are based on local linear operators. Work of information technology was illustrated by the example of improve visual quality of text image that was transmitted via webcam

Keywords: crossplatform systems, information technology, shaders, streaming video, video processing.

UDC 519.254:004.932(045)

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INFORMATION TECHNOLOGY PERCENTAGE INCREASE OF IMAGE COMPRESSION BASED ON LINEAR FILTERS

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Proposed information technology increase percentage of lossy image compression. The information technology include invariant transformation procedures in aggregate with noted methods thus can improve the percentage of compression with unnoticeable lowering quality. The rationale for application of new technology is statistically significant results of experimental investigation including those with a group of independent users.

Keywords: image processing, information technology, liner filters, lossy compression, qualitative assessment.

UDC 378.1:004:303.732.4(477)

N. Sidorova

SKILL FORMING OF SOFTWARE ENGINEERING BACHELORS FOR PROFESSIONAL COMMUNICATION

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Software engineering industry in Ukraine is steadily developing. That is why the need in specialists software engineers. At the same time it is essential to formation professional communication of software engineers. Distinctive features of said approach are considered. Principal objectives of revision of literature on software engineering education and creation of ontology on professional communication of engineers are set and solved.

Keywords: group dynamics, ontology, professional communications, software engineering, training.

UDC 620.179:534.6

S. Filonenko, T. Nimchenko**INFLUENCE OF CUTTING DEPTH ON REGULARITIES OF PARAMETERS OF ACOUSTIC EMISSION**National Aviation University
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We made modeling of acoustic emission by growth of cutting depth of work material that comes under plastic deformation and area of its destruction. AE impulse signals which form by the process of plastic deformation and destruction were put at the basis of a model structure. Regularities of changes of amplitude-power parameters of AE formed resulting signals were determined in the work. It is defined that by increasing of material volume, which comes under plastic deformation, and the destruction area, increasing of amplitude-power parameters of AE result signals takes place. It is shown that average amplitude level of AE result signals is increasing by linear law, and average level of energy and summary energy on the determined interval of selection is changing by non-linear laws. Increasing of energetic parameters of AE formed result signals happens faster than increasing of average level of their amplitude. It is defined that increasing of analyzed materials dispersing value happens simultaneously with increasing of amplitude-power parameters of AE result signals by increasing of volume of the material that comes under plastic deformation and the area of destruction. It is defined that in numerical ratio of dispersion increasing and standard deflection of average levels of the amplitude and AE result signals energy considerably excel increasing of its own values. Besides, increasing of dispersion and standard deviation of average levels of the amplitude and AE result signals energy have higher sensitivity to increasing of level of the examined material that comes under plastic deformation and area of destruction and can be used as informative parameters.

Keywords: acoustic emission, cutting of the material, deformation, depth of cut, destruction, diagnostics, model of signal.

UDC 532.52(045)

¹O. Puzik, M. Glazkov, V. Laneckyi, G. Zaionchkovskiy, ²T. Tarasenko**HYDRODYNAMIC CHARACTERISTICS OF FUNCTIONAL CAVITATION DEVICES**National Aviation University
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Proposed and justified method of calculating the parameters of functional cavitation devices. It was obtained summarized and calculated dependencies of critical parameters for determining leakage. Using the experimental data are built graphical dependencies for determining the capacity of the holes and nozzles.

Keywords: cavitation outflow, choke, flow coefficients, nozzle.

UDC 725.42:631.2(045)

¹V. Pershakov, O. Lucenko, ²T. Petrova, O. Solovyov**NON-SKELETON BUILDING OF MULTIPURPOSE DESTINATION**National Aviation University
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The non-skeleton structure of multipurpose destination is developed from typical reinforce-concrete slabs and intended for building of objects of agroindustrial complex. Fixed building is under the test loadings. After researches was established, that a construction has sufficient bearing capacity. Non-skeleton building is urgent for storage of agricultural production and storage of equipment, placing of markets and sport complexes.

Keywords: agroindustrial complex, experimental researches, loadings, non-skeleton structures.

UDC 72.012.8:725.39(045)

V. Zelenkova**SMALL ARCHITECTURAL AND SCULPTURAL FORMS ARE IN DESIGN OF INTERIORS OF AIR TERMINALS**

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Determination of small forms is considered in architecture and in a sculpture. Certainly difference between national and international style in a design. Their use is considered in the design of interiors of passenger spaces of air terminals on existent examples. Connection is analysed between architectural small forms and by the sculpture of small forms, which consists in the transmission of the general semantic and aesthetically beautiful loading on a man, namely to create feeling of comfort, national self-esteem, national pride, and but to consciousness

Keywords: aerostation spaces, airports, architectural, design, national style.

UDC 577.4:658.382.3:628.31

V. Berezuckyi**THEORY OF ACTIVE HITTINGS IS IN PROCESSES OF ELECTRO-COAGULATION THE ADMIXTURES IN WATER TECHNOLOGICAL ENVIRONMENT**

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In the article theoretical bases of electro-coagulation of admixtures are examined in a water technological environment with the use of theory of the active hittings, which are based on the results of the executed researches and analysis of scientific information. Application of theory of the active hittings is in coagulation, provides high efficiency of process of extraction of admixtures from water environments during minimization of energy consumption and expenses of materials.

Keywords: active hittings, chemical technologies, electro-coagulation, fractionating coagulation, masso transfer, theory.

UDC 632.118.3(045)

¹O. Tykhenko, ²O. Mikheev**INVESTIGATION OF THE ABSORBING CAPACITY OF PLANTS UNDER CONDITIONS OF STRESSOR IMPACT BY THE RESIDUAL RADIOACTIVITY METHOD**

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The aim of work has been the investigation of UV-radiation influence on the absorbing capacity of plant objects in relation to radionuclide using the new method of biological objects state registration under the conditions of stressor impact – the residual radioactivity method, that is based on measuring absorption of potassium chemical analog – caesium-137, that is brought in chloride compound into cultural medium. As a result of conducted investigation, the prognostic potential of the residual radioactivity method has been estimated. There have been determined, first, that the method could to be used in the form of impulse sprout incubation with radiotracer, second, it has to be taken into account that inhibition of absorbing capacity by certain stressor dose occurs two days earlier than the state of plant activity inhibition is fixed.

Keywords: absorbing capacity, gormesis, residual radioactivity, stress, stress factor, UV-ratiation.

UDC 504.05(477.41)(045)

¹N. Kichata, ²V. Zaplatynskyi**SOURCES OF ECOLOGICAL HAZARDS FOR SUBURBAN AREAS**

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The article is devoted to analysis of sources of hazards in the areas adjacent to large cities, in particularly Kiev. In this work a new concept "suburban areas" was offered and quite high level of ecological danger, created in suburban areas due to several hazards, was proved. The sources and key factors of ecological danger for Kiev region were shown and classification of this area into zones of ecological danger was made.

Keywords: ecological hazard, pollution, risk, suburban area, threat.

UDC 613.84(045)

G. Arkhipova, Y. Makarenko

INFLUENCE OF THE TOBACCO SMOKING ON THE ORGANISM OF MAN

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The article presents current facts about the negative influence of tobacco smoking on the human health. The problem requires the solution as the amount of smokers is increased in our country from year to year. The consequences of smoking can cause considerable harm to the smokers and to people around them. The structure of tobacco smoke was considered. The negative influence of the most dangerous components of tobacco smoke, particularly Cd and ²¹⁰Po, was described.

Keywords: sickness rate, tobacco smoking, toxic substances (Cd, ²¹⁰Po).

UDC 665.6(567)(045)

S. Boichenko, Ibraheem Asaad M. Ali

PHYSICAL AND CHEMICAL PROPERTIES AND STRUCTURAL-GROUP COMPOSITION OF STRAIGHT-RUN FRACTIONS OF IRAQI OILFIELDS

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Iraq is one of the richest countries of the Near East in terms of oil reserves. Only Saudi Arabia has greater hydrocarbon reserves. Despite the fact that commercial oil production is implemented since 1927, the harsh social and political and economic situation added with long-time military conflict had totally destroyed oil processing infrastructure. Considering this factor, one of the key tasks for this country is building of a new, contemporary oil processing infrastructure. Thus, complex study of oils as well as their straight-run fractions is a requirement for preparation of the projects of oil processing plants that are consistent with current hard requirements. This material contents results of physical and chemical studies of straight-run oil fractions as gasoline, Diesel oil, and heavy oils. Properties of fractions shown below, their potential related to export oil products are essential data for preparation of process flow diagram of the oil processing plant.

Keywords: diesel oil fraction, gasoline fractions, heavy oil, Iraqi oil fields.

UDC 662.75:621.593.3

S. Ivanov, V. Efimenko, O. Efimenko**THERMOOXIDATIVE STABILITY OF JET FUEL
WITH FULLERENES AS AN ADDITIVE**National Aviation University
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Heating of fuels in presence of oxygen reduces their thermal-oxidative stability, leads to a solid phase in the form of sludge and tar, which, sedimented at the details of the fuel system, change its characteristics and cause contamination of fuel filters and injectors, spool control sticking, reduce efficiency of heat exchangers. Nanomaterials, performance of which is considerably superior to the natural materials, are the basis for the movement of humanity's progress. Therefore, with a development of technologies it has become necessary to carry out a research of modified additives – fullerenes, to improve an oxidative stability of fuels. We have carried out an investigation of thermal-oxidative stability of fuel RT as a function of additive C₆₀ concentration. The results has shown that even 0,043 g/l fullerene addition as an antioxidant, reduces the amount of sediment in the fuel almost by half. Usage of fullerenes for improvement of petroleum products performance properties is a promising area of research.

Keywords: fulleren, jet fuel, thermooxidative stability, sediment concentration.

UDC 628.349.094.3:547.362.1

¹V. Trachevskiy, ²K. Molozovenko, M. Zinchenko**PLASMA SURFACE MODIFICATION OF POLYETHYLENE TEREPHTHALATE MEMBRANES**National Aviation University
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The influence of low-temperature plasma membrane surface of polyethylene terephtalate. The possibility of a polyethylene terephtalate membranes with the required surface properties.

Keywords: membrane, plasma, polymerization, surface hydrophilicity.

UDC 582.284.3:577.151.5(045)

¹A. Buchalo, ²A. Dugan, ³M. Maksimyuk, ⁴V. Linovytska**ENZIME ACTIVITY OF HIGHER BASIDIOMYCETES MUSHROOM
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The purpose of this work was a revelation and evaluation of spectrum and activity of hydrolytic enzymes of higher basidiomycetes *Schizophyllum commune* in a surface and submerged culture. 21 strains of *S. commune* were object of investigation. Researches were conducted by standard microbiological, biochemical and biotechnological methods. All strains on agar mediums were shown the following enzymes: amylase, caseinase, gelatinase, polygalacturonase, pectatranselyminase, urease, lipase, cellulase, laccase and peroxydase. The demonstration of oxidizing enzymes of laccase and peroxydase depended on composition of medium. The estimation of presence and level of activity of endo-1,4- β -glucanase, exoglucanase and monophenolmonooxygenase at submerged cultivation indicate primary influence of components of complex nourishing medium on enzyme activity of strain 1760 *S. commune*.

Keywords: complex liquid nourishing mediums, endo-1,4- β -glucanase, exoglucanase, hydrolytic enzymes, monophenolmonooxygenase, qualitative color enzyme reactions, reducing substances, *Schizophyllum commune*.

UDC 371.26(045)

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TESTING AS A KIND OF CONTROL WHEN TEACHING ENGLISH

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The article focuses on functions and methods of testing the students' competence in compliance with English for specific purposes. A guide for assessing learning outcomes at different levels and helping to identify the objects and forms of assessment is provided in the article. The principle advantages of students' knowledge testing are given in the article. The necessity for developing of the language tests variety is formulated.

Keywords: assessment system, testing, validity.

UDC 811.111:371.3(045)

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COMMUNICATIVE COMPETENCE OF AIR TRAFFIC CONTROLLER-INSTRUCTOR

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The article focuses on the issue of communication competence as a precondition of pedagogy competency formation of an ATCO-trainer as a constituent of his capacity to provide quality SIMU- training of the air traffic controllers. The current University curriculum for air traffic controllers does not provide developing of the pedagogical competence. But it is requested very much when an air traffic controller is employed as a controller-trainer for SIMU-training. It is suggested to include pedagogical science as a course in the University program which should include communication competence.

Keywords: air traffic controller-instructor/trainer, aviation controller, communicative competence, pedagogical competency, SIMU-training.