

**XIII International Scientific
Conference «Electronics and
Applied Physics»**

Report of Contributions

Contribution ID: 12

Type: **Oral**

Ion induced structures of millimeter-size on tungsten surface

Polished tungsten sample with purity 99.99% wt. has been exposed to Ar ion beam generated by FALCON ion source. Typical parameters during steady-state expose were the following: Ar ion flux was $2\text{-}3 \times 10^{22} \text{ m}^{-2}\text{s}^{-1}$, heat flux was about 3 MW m^{-2} , average ion energy of 2 keV and the ion fluence reaches 10^{27} m^{-2} . During the exposures, the temperature of sample reaches 1200 K. Following the exposure, SEM study revealed that surface is populated with castle-like structures with density of 2-3 features per mm^2 . Their shape is distinguished by high height-to-diameter aspect ratio and pronounced asymmetry. Typical height of the structures exceeds what has been reported in the literature (1-100 μm) and reaches 0.3-0.4 mm.

Primary authors: Dr GIRKA, Oleksii (V.N. Karazin Kharkiv National University); Prof. BIZYUKOV, Oleksandr (V. N. Karazin Kharkiv National University); Mrs BALKOVA, Yuliia (V. N. Karazin Kharkiv National University); Mr MYROSHNYK, Maksym (V. N. Karazin Kharkiv National University); Dr BIZYUKOV, Ivan (V. N. Karazin Kharkiv National University)

Presenter: Dr GIRKA, Oleksii (V.N. Karazin Kharkiv National University)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 13

Type: **Poster**

Excitation of guanine molecules in gas phase under the low energy electron beam

The processes of excitation of guanine molecules in the gas phase under the influence of slow electrons are investigated. The spectra of emission of molecules in the wavelength range of 200 - 800 nm for different energies of the exciting incident are obtained. The identification of spectral bands and the definition of their excitation thresholds are performed.

Primary authors: Dr SHAFRANYOSH, Miroslav; SVIDA, Yuriy; MARGITICH, Mykola; SUKHOVIYA, Maria; SHAFRANYOSH, Ivan

Presenter: Dr SHAFRANYOSH, Miroslav

Track Classification: Medical Physics

Contribution ID: 14

Type: **Oral**

MAGNETOHYDRODYNAMIC INSTABILITY ON CONCAVE WALL OF TOKAMAK LIQUID DIVERTOR

An idea of the Liquid Lithium Divertor has been proposed many years ago and has been realized at National Spherical Torus Experiment [1]. The liquid metal of divertor moves permanently to provide a material recycling and a shape of the divertor is curved to repeat the geometrical features of the confinement magnetic field. In such a way there are the necessary conditions for development of Görtler instability. Görtler instability develops in the boundary-layer flow over a concave surface. Originally the instability is hydrodynamic one, but the magnetic field changes its features essentially. The Görtler vortices exist and can be identified when the liquid flows are not laminar anymore and don't reach a turbulent regime which seems to be described numerically only. Formation and development of the Görtler vortices are studied by analytical and numerical approaches.

Primary authors: Ms VELIZHANINA, Yelyzaveta (V. N. Karazin Kharkiv National University); Dr PAVLENKO, Ivan (V. N. Karazin Kharkiv National University); Prof. KNAEPEN, Bernard (Université libre de Bruxelles); Ms BOURCY, Sarah (Université libre de Bruxelles)

Presenter: Ms VELIZHANINA, Yelyzaveta (V. N. Karazin Kharkiv National University)

Track Classification: Plasma Physics

Contribution ID: 15

Type: **Oral**

SOME PROBLEMS OF SATURATION THE EXCITATION AND PHASE TRANSFORMATIONS IN RELAXED OPTICS

Problems of saturation the excitation and phase transformations in Relaxed Optic are discussed. Basic mechanisms and models, which are used for the modeling these processes are analyzed. Was shown that cascade model allows to explain basic experimental data.

Primary author: Dr TROKHIMCHUCK, Petro (Lesya Ukrayinka East European National University)

Presenter: Dr TROKHIMCHUCK, Petro (Lesya Ukrayinka East European National University)

Track Classification: Laser Physics and Optoelectronics

Contribution ID: 16

Type: **Oral**

TUNABLE SPIN PUMPING INTO METALLIC LEADS

Spin pumping, a method of generating a spin current from a magnetic material into an adjacent non-magnetic metal, can be considered as a spintronic analog of a battery in conventional electronics. In this work, we discuss how spin-polarized charge flow into normal and superconducting wires can be realized and controlled using a three-arm quantum beam splitter.

Primary author: Prof. BELOGOLOVSKII, Mikhail (Vasyl' Stus Donetsk National University)

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Presenter: Prof. BELOGOLOVSKII, Mikhail (Vasyl' Stus Donetsk National University)

Track Classification: Physics of Magnetism

Contribution ID: 17

Type: **Poster**

Theoretical Calculation of Refractive Indices of Ternary Chalcogenide Compounds

AgGaS₂, CdGa₂S₄, CdGa₂Se₄ crystals belong to the large class of triple chalcogenide compounds. These crystals are widely used in various nonlinear optical devices. Therefore calculation of optical properties of these compounds is important. In this work high frequency refractive indices are calculated by using Harrison's bond-orbital method.

Primary authors: Mr KAMENSHCHIKOV , Volodymir; Prof. SUSLIKOV, Leonid

Presenter: Mr KAMENSHCHIKOV , Volodymir

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: 18

Type: **Poster**

OPTICAL RADIATION OF MOLECULES OF NITROGENOUS BASES OF NUCLEIC ACIDS IN THE FIRM PHASE AT ELECTRONIC EXCITATION

The method of electron-photon spectroscopy is applied to an important class of six-membered heterocyclic compounds – the nitrogenous bases which are a part of nucleic acids. Spectral characteristics of the molecules of cytosine and uracil adsorbed on the surface of graphite are analyzed. In UV and visible areas of the spectrum three wide unstructured strips are found. The most intensive UV-strip is attributed to fluorescence and there corresponds to the singlet-singlet transition from the first excited electronic state to the main condition of molecules. Electronic transitions from the triplet T₁ to the main state form in visible area the second, less intensive strip of a phosphorescence. The nature of the third strip, with a maximum $\lambda = 495$ nanometers, is discussed.

Primary authors: Dr MITROPOLSKIY, Igor (Uzhgorod National University); Prof. SHAFRANYOSH, Ivan (Uzhgorod National University); Mr KUZMA, Vasyl (Uzhgorod National University); Mr BIR-IUKOV, Vladyslav (Uzhgorod National University); Dr SUKHOVIYA, Mariya (Uzhgorod National University)

Presenter: Dr MITROPOLSKIY, Igor (Uzhgorod National University)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 19

Type: **Poster**

MAGNETIC BIAS AND THERMALLY INDUCED MAGNETIZATION REVERSAL IN THE RARE-EARTH ORTHOERRITE

Within the framework of a mean field theory the origin of a spin- reorientation transition, compensation point, magnetic bias and thermally induced spin reversal have been investigated for rare-earth orthoferrites. It is considered the most general case of two sublattice antiferromagnetic with exchange anisotropy and rare-earth - iron interactions. A small applied field appears to be a source of the additional anisotropy from canting of the sublattice moments. This anisotropy leads to imbalance of free energy for two types of domains. As a result we have a spin jump near the compensation point. A similar phenomenon is observed experimentally in the erbium orthoferrite.

Primary author: ZUBOV, E.E. (G.V. Kurdyumov Institute for Metal Physics)

Presenter: ZUBOV, E.E. (G.V. Kurdyumov Institute for Metal Physics)

Track Classification: Physics of Magnetism

Contribution ID: 20

Type: **Oral**

BACKGROUND FOR THE TIME - DOMAIN SPECTROSCOPY

Femtosecond time – domain spectroscopy method is proposed. Spectral peculiarities of the Elementary Wave Packets series which was used for femtosecond pulse decomposition are well adopted for ultrawideband spectral analysis. Example of single spectral line spectroscopy is shown.

Primary author: Prof. OVECHKO, Volodymyr (Taras Shevchenko National University of Kyiv)

Presenter: Prof. OVECHKO, Volodymyr (Taras Shevchenko National University of Kyiv)

Track Classification: Laser Physics and Optoelectronics

Contribution ID: 21

Type: **Oral**

Sol-gel coatings with the high erbium concentration for optoelectronics and photovoltaics

The erbium oxide coatings were formed by the sol-gel method on the monocrystalline silicon wafers. The thickness of the obtained coatings was about 100-150 nm. Strong Er luminescence with a maximum at 1.53 μm is observed from the oxide films.

Primary authors: KHOROSHKO, Liudmila (Belarusian State University of Informatics and Radioelectronics (BSUIR)); Ms KORNILOVA, Yuliana (Belarusian States University of Informatics and Radioelectronics (BSUIR)); Prof. GAPONENKO, Nikolai (Belarusian States University of Informatics and Radioelectronics (BSUIR))

Presenter: KHOROSHKO, Liudmila (Belarusian State University of Informatics and Radioelectronics (BSUIR))

Track Classification: Laser Physics and Optoelectronics

Contribution ID: 22

Type: **Oral**

METHOD OF CALCULATION OF PLASMA BOUNDARY POSITION IN HIGH VOLTAGE GLOW DISCHARGE ELECTRON GUNS FORMED THE TUBE-LIKE ELECTRON BEAMS

The numerical method of calculation of anode plasma boundary position in the electrodes systems of high voltage glow discharge electron sources, formed the tube-like electron beams, is considered in this paper. The method is based on defining of plasma boundary position in the simple electrodes' system with the plane electrodes and recalculation the volume of plasma to considered electron gun with the complex shape of electrodes. Obtained graphical dependences of plasma volume on the highness of plasma and on constructive geometry parameters of electrodes are presented.

Primary authors: Mr MELNYK, Igor (Dr.); Mr CHERNYATINSKIY, Igor; Mrs PIASETSKA, Natalia (Student)

Presenter: Mr MELNYK, Igor (Dr.)

Track Classification: Plasma Physics

Contribution ID: 23

Type: **Poster**

OPTICAL CHARACTERISTICS AND PARAMETERS OF GAS- DISCHARGE ATMOSPHERIC PRESSURE PLASMA IN A MIXTURE OF MERCURY DIODIDE AND MERCURY DIBROMIDE VAPOR, NITROGEN AND HELIUM

The results of diagnostics of spectral, temporal, and energy characteristics of radiation of a gas-discharge plasma on a mixture of mercury dibromide vapor and mercury diiodide vapor with helium and nitrogen in the spectral range 350 ± 800 nm, as well as plasma parameters in the range of reduced electric field $E/N = 1-100$ Td are presented.

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Presenter: Dr MALININA, Antonina (Uzhgorod National University)

Track Classification: Plasma Physics

Contribution ID: 24

Type: **Poster**

PLASMA PINCH STABILIZATION IN HIGH-CURRENT PULSED PLASMA DIODE FOR DIRECTION EUV RADIATION GENERATION

The work is related to stabilization of the plasma pinch and generation zones of directional EUV radiation by an external strong (up to 30 T) magnetic field in a high-current pulsed plasma diode with a limited working surface of a high-voltage electrode. The estimation of the external magnetic field magnitude which is necessary to stabilize the plasma pinch in the whole discharge stage has been made. The dependencies of the discharge current, discharge active voltage and active power inputted into the discharge under various initial conditions have been obtained. The radiation patterns depending on the geometry of the plasma formations and plasma density have been calculated. It has been shown that the external strong magnetic field stabilizes the plasma pinch and the mode of energy input into the discharge.

Primary authors: Mr HRECHKO, Yaroslav (V.N. Karazin Kharkiv National University); Prof. AZARENKOV, Nikolay (V.N. Karazin Kharkiv National University); Dr TSELUYKO, Aleksandr (V.N. Karazin Kharkiv National University); Dr BABENKO, Ievgeniia (V.N. Karazin Kharkiv National University); Mr RYABCHIKOV, Dmitrii (V.N. Karazin Kharkiv National University); Dr SEREDA, Igor (V.N. Karazin Kharkiv National University); Mr KASIRIN, Anton (V.N. Karazin Kharkiv National University)

Presenter: Mr HRECHKO, Yaroslav (V.N. Karazin Kharkiv National University)

Track Classification: Plasma Physics

Contribution ID: 25

Type: **Poster**

Experimental and calculated characteristics and parameters of the plasma of nanosecond barrier discharge in a mixture of argon-freon

The results of experimental research and simulations of the characteristics of a two-wave UV-VUV lamp on a mixture of argon and freon vapor (CCl₄) with pumping by a nanosecond barrier discharge are presented.

Primary author: Ms HRYTSAK, Roksolana (Uzhhorod National University, Faculty of physics, Department of Quantum Electronics)

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Presenter: Ms HRYTSAK, Roksolana (Uzhhorod National University, Faculty of physics, Department of Quantum Electronics)

Track Classification: Plasma Physics

Contribution ID: 26

Type: **Oral**

PHOTODIODES SPECTRAL SENSITIVITY INFLUENCE ON THE TWO FOILS SOFT X-RAY TECHNIQUE IN THE URAGAN TORSATRONS.

Soft X-ray (SXR) diagnostics is routinely used in URAGAN-3M and URAGAN-2M torsatrons. One of the SXR diagnostic applications is based on the plasma temperature estimation. The ratio of the SXR signals passed through two different foils is used for the temperature estimation. The spectral sensitivity of the photodiode itself can affect the temperature measurement in addition to the spectral dependence of the foil absorption function. Set of different modeling spectral sensitivity functions was used for numerical calculation of the SXR signals ratio. The influence is negligible in the case of the flat sensitivity in the energy range 5-500eV in the case of thin Al foils (for example in the AXUV-20EL photodiodes case)

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Presenter: Ms TURIANSKA, Olena (Institute of Plasma Physics, National Science Center “Kharkiv Institute of Physics and Technology”)

Track Classification: Plasma Physics

Contribution ID: 27

Type: **Poster**

Influence of electromagnetic radiation on characteristics of superconductor-manganite nanocomposite

We study temperature dependence of resistance and current-voltage characteristics of nanocomposite $\text{MgB}_2\text{-La}_{0.67}\text{Ca}_{0.33}\text{MnO}_3$ formed by components with substantially different granules size: MgB_2 (5-10 μm) and $\text{La}_{0.67}\text{Ca}_{0.33}\text{MnO}_3$ (20-30 nm). Nanocomposite under consideration is a three-dimensional structure of weakly coupled Josephson-type S-FM-S contacts (S-superconductor, FM-ferromagnetic metal). Electromagnetic radiation effects on the superconducting resistive transition and the current-voltage characteristics of the nanocomposite were detected and discussed.

Primary authors: BOLIASOVA, Olha; Ms KONONENKO, Viktoriya (Donetsk Institute for Physics and Engineering, the NAS of Ukraine); Prof. KRIVORUCHKO, Vladimir (Donetsk Institute for Physics and Engineering, the NAS of Ukraine); Dr TARENKOV, Vladimir (Donetsk Institute for Physics and Engineering, the NAS of Ukraine)

Presenter: BOLIASOVA, Olha

Contribution ID: 28

Type: **Poster**

SYNTHESIS OF NANOSTRUCTURES UNDER ACTION OF THE STRONGLY OVERSTRAINED NANOSECOND DISCHARGE IN THE AIR ATMOSPHERIC PRESSURE

The conditions for the deposition of metal nanostructures as a result of sputtering the electrode material of a highly over-stressed high-current nanosecond discharge between copper electrodes in atmospheric pressure air are given. It is shown that this discharge is a selective source of UV radiation in the spectral range of 200-230 nm on the transitions of copper and zinc atoms and ions. On the surface of glass substrates, nanostructured film are synthesized. Transmission spectra and photoluminescence spectra of film obtained by sputtering copper electrodes

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Presenter: Mr DANYLO, Vladyslav (Uzhhorod National University)

Track Classification: Plasma Physics

Contribution ID: 29

Type: **Poster**

CHARACTERISTICS OF OVERVOLTAGE NANOSECOND DISCHARGE IN A MIXTURE OF AIR WITH COPPER STEAM

Spatial, electrical and optical characteristics of a high-voltage nanosecond discharge between electrodes from copper in atmospheric pressure air in a highly overvoltage interelectrode discharge gap of 1 mm are presented. It is shown that this discharge is a selective source of copper ion UV radiation in the spectral range of 200-230 nm, which is perspective for use in point UV lamps

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Presenter: DANYLO, Vladyslav (Uzhhorod National University)

Track Classification: Plasma Physics

Contribution ID: 30

Type: **Poster**

PHOTOELECTRIC PROPERTIES OF IRON AND CHROMIUM OXIDES NANOMETRIC FILMS ON THE SI <100> SUBSTRATE.

The nanometric films based on iron and chromium oxides ($\text{Fe}_2\text{O}_3\text{-X}$ ($0 \leq x \leq 1$) and $\text{Cr}_3\text{-XO}_3\text{-Y}$ ($0 \leq x \leq 2$; $0 \leq y \leq 2$)) with variable thickness, stoichiometry and photoelectrical properties were synthesized using ultraviolet photons of KrF-laser (248 nm) on the silicon substrate Si <100> at the substrate's temperature $T_S = 293^\circ\text{K}$. The samples of mono- and hybrid systems of the alternate layers $\text{Fe}_2\text{O}_3\text{-X}$ ($0 \leq x \leq 1$)/ $\text{Cr}_3\text{-XO}_3\text{-Y}$ ($0 \leq x \leq 2$; $0 \leq y \leq 2$) demonstrate photoelectric properties. The kinetics ($\lambda = 470$ nm) of the photo-e.m.f. of the observable samples was studied and the spectral dependencies (500 ÷ 1200 nm) of the photo-e.m.f. of these samples were obtained.

Primary authors: Mrs SADOVNIKOVA, Maria L. (Institute of High Technologies, Taras Shevchenko National University of Kyiv); Dr SMIRNOV, Alexey B. (V. Lashkaryov Institute of Semiconductor Physics, NAS of Ukraine); Dr SAVKINA, Rada K. (V. Lashkaryov Institute of Semiconductor Physics, NAS of Ukraine); Prof. MULENKO, Sergii A. (G.V. Kurdumov Institute of Metals Physics of NAS Ukraine)

Co-authors: Dr VASILJEV, Anatoliy G. (Institute of High Technologies, Taras Shevchenko National University of Kyiv); Mr LEDINYOV, Dmitriy M. (V. Lashkaryov Institute of Semiconductor Physics NAS of Ukraine); Dr VDOVENKOV, Anatoliy A. (Institute of High Technologies, Taras Shevchenko National University of Kyiv)

Presenter: Mrs SADOVNIKOVA, Maria L. (Institute of High Technologies, Taras Shevchenko National University of Kyiv)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 31

Type: **Poster**

SOME OPTICAL PROPERTIES AND IV CHARACTERISTICS OF NANOMETRIC FILM BASED ON TRANSITIONAL METALOXIDES

The nanometric film based on iron and chromium oxides combination ((Fe₂O₃-Y(0≤x≤1)/Cr₃-XO₃-Y (0≤x≤2; 0≤y≤2) /Fe₂O₃-Y/Cr₃-XO₃-Y)) with thickness near 10 nm was synthesized using ultraviolet photons of KrF-laser (248 nm) on the silicon substrate Si <100> at the substrate's temperature TS = 800°K. This hybrid system of the alternate layers has two differently colored areas. In this work the optical properties and IV-characteristics of the specimen were obtained. The SEM of the specimen shows the homogeneity of the observable film but also reveals inclusions on the substrate surface under the film each near 0.1-0.3 μm in diameter. The straightness of IV characteristic confirms that the contacts were ohmic and shows the resistance of investigated specimen in the darkness, are different for differ areas of the film. The averaged value of the film's resistance is near 48MΩ.

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Presenter: Mrs SADOVNIKOVA, Maria L. (Institute of High Technologies, Taras Shevchenko National University of Kyiv)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 32

Type: **Poster**

TIME EFFECTS IN THE SOLUTIONS OF GLUCOSE AND FRUCTOSE

We proposed a new method for studying the process of generation of inhomogeneities in an aqueous solution by dissolving of glucose. In crystalline form the molecules of glucose are in the form of a ring. In the process of dissolution the ring opens up and turns into a chain structure then it forms in the ring again. During the achieving of equilibrium, occurs change of the optical activity of glucose solution in water. This occurs because the different forms have different values of optical activity. After equilibration optical activity of glucose solution becomes constant. This phenomenon is called Mutarotation. Water molecules form aggregates around molecules of glucose whose dimensions are close to the wavelength of light. Also after dissolving glucose in water we can observe light scattering on the aggregates.

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Presenter: Ms KRAVCHENKO, Daryna (Taras Shevchenko National University of Kyiv)

Track Classification: Medical Physics

Contribution ID: 33

Type: **Oral**

OPTIMIZING INDEX RANGE OF “MULTIPLY-RIGHT-SHIFT” PERFECT HASH FUNCTION ON THE EXAMPLE OF INTELLECTUAL BOARD GAMES

The process of building and optimizing perfect-hash function so called “magic bitboards” were analyzed. The datastructure of board-games algorithms are mostly 64-bit integer and multiply-right-shift method of building perfect hash function is very natural for modern hardware. The main goal of optimization – decrease the size of lookup-tables to L1 cache of processor.

Primary authors: Mr OLEKSII, Morozov; Dr MARIIA, Morozova

Presenter: Mr OLEKSII, Morozov

Track Classification: Computer Engineering

Contribution ID: 34

Type: **Oral**

CAPACITANCE-VOLTAGE PROFILING AND CAPACITANCE KINETICS OF THE ITO-NANO-TiO₂ GAS-SENSITIVE SAMPLES AT VARIOUS FREQUENCIES

The capacitance-voltage characteristics and measuring of capacitance kinetics were applied for investigation of absorptive response physics of the ITO – nanostructured TiO₂ heterojunction. The studies were realized for air and ethanol vapour under various frequencies of probing signal. It was shown that processes of traps recharging are making the most significant contribution to the total capacitance of the studied heterojunction and playing a major role in forming of absorptive response to the ethanol molecules.

Primary authors: SKRYSHEVSKY, Valeriy (Taras Shevchenko National University of Kyiv); KOSTIUKEVYCH, Oleksandr (Taras Shevchenko National University of Kyiv); LUSHKIN, Oleksandr (Taras Shevchenko National University of Kyiv); IVANOV, Ivan (Taras Shevchenko National University of Kyiv)

Presenter: KOSTIUKEVYCH, Oleksandr (Taras Shevchenko National University of Kyiv)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 35

Type: **Poster**

ONE EXAMPLE OF EXACTLY SOLVABLE QUANTUM MECHANICS PROBLEM OF POSITION DEPENDENT MASS

This communication has been dedicated to quantum dynamics of particle whose mass depends on coordinate. We considered one dimensional model which admits to obtain the exact solution of wave equation. The position dependent mass was represented as the periodic function. Inside of period the mass varies accordingly to the inverse proportionality. We have found wave functions in their explicit form as well as energy eigen values. It has been shown that the energy spectrum manifests properties typical for periodic nanostructures.

Primary author: Dr BURDEYNYY, Volodymyr (VNTU)

Presenter: Dr BURDEYNYY, Volodymyr (VNTU)

Contribution ID: 36

Type: **Poster**

PHYSICAL PROPERTIES OF LUMINESCENT “MICROCRYSTALLINE CELLULOSE – OXIDE – CARBON NANOTUBE” COMPOSITES

Microcrystalline cellulose doped with luminescent oxides particles composites were made by cool pressing procedure. Morphology, crystallinity, luminescence and dielectric characteristics of the composites were studied. Their morphology can be described as “ceramics - like” type as it consists of cellulose plates and embedded oxide particles. Luminescence spectra of the composites covers all the range of the visible light, 350 – 750 nm, and comprises both wide band and narrow lines, related with host and oxides luminescence, respectively. Studied composites can be perspective materials for transformation of the single colour LEDs radiation into white light.

Primary authors: Dr CHORNII, Vitalii (Taras Shevchenko National University of Kyiv); Dr BOYKO, Volodymyr (2National University of Life and Environmental Sciences of Ukraine); Dr ALEKSEEV, Oleksander (1Taras Shevchenko National University of Kyiv, 64/13 Volodymyrska str., 01601 Kyiv, Ukraine); Prof. NEDILKO, Serhii (Taras Shevchenko National University of Kyiv); Dr SHERBATSKII, Vasyi (Taras Shevchenko National University of Kyiv); Dr LAZARENKO, Maxym (Taras Shevchenko National University of Kyiv); Prof. REVO, Serhii (Taras Shevchenko National University of Kyiv); Dr NEDIELKO, Maxym (3Paton Electric Welding Institute of NASU)

Presenter: Dr CHORNII, Vitalii (Taras Shevchenko National University of Kyiv)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 37

Type: **Oral**

USING THE SYSTEM SPECTRAL ANALYSIS FOR DETECTING EFFECTS FROM ROCKET LAUNCHES FROM REMOTE COSMODROMES

Results from the system spectral analysis of variations in the geomagnetic field horizontal components, which are associated with the orbital maneuvering subsystem engine burns and the firing of the booster stages of the Soyuz and Proton rockets at the Plesetsk and the Baikonur cosmodromes, are presented for the 2014 – 2017 period.

Primary authors: SMIRNOVA, Kateryna (V.N. Karazin Kharkiv National University); CHERNOGOR, Leonid; GARMASH, Kostyantyn; ROZUMENKO, Victor

Presenter: SMIRNOVA, Kateryna (V.N. Karazin Kharkiv National University)

Track Classification: Radio Engineering and Communications

Contribution ID: 38

Type: **Oral**

A Case Study of Acoustic Effects from the Chelyabinsk Meteoroid: The System Spectral Analysis

Infrasound effects from the Chelyabinsk meteoroid observed at the Ukrainian (2500km) and Russian(1417 km) research stations are described. The signal time delay and celerity have been determined by applying the basic for analyzing acoustic effects techniques, the system spectral analysis and the band-pass filtering. The basic periods and durations of the acoustic signals have been determined. The difference in the celerity of the infrasound and the speed of acoustic waves has been explained.

Primary authors: Mr CHERNOGOR, Leonid; SHEVELEV, Mykyta (V. N. Karazin Kharkiv National University)

Presenter: SHEVELEV, Mykyta (V. N. Karazin Kharkiv National University)

Track Classification: Radio Engineering and Communications

Contribution ID: 39

Type: **Poster**

MAGNETORESISTIVE PROPERTIES OF GRANULAR NANOSTRUCTURES BASED ON PERMALLOY AND SILVER

The magnetoresistive properties of granular nanostructures based on permalloy (Ni₈₀Fe₂₀) and Ag prepared by the co-evaporation technique are presented. Effect of thermal annealing on magnetoresistance was described. It was shown that after annealing up to 600 K the transmission from isotropic character of magnetoresistance to anisotropic one is observed.

Primary authors: Mr SHULYARENKO, Denys (Sumy State University); Dr PAZUKHA, Iryna (Sumy State University); Ms ODNODVORETS, Kateryna (Sumy State University)

Presenter: Mr SHULYARENKO, Denys (Sumy State University)

Track Classification: Physics of Magnetism

Contribution ID: 40

Type: **Oral**

SHIFT OF SATURATION FIELD UPON ALTERATION OF SINGLE-CRYSTAL BARIUM HEXAFERRITE THICKNESS

The work presents the results of experimental investigation into the process of transition from multidomain state of uniaxial single-crystal BaFe₁₂O₁₉ to the saturation one under the normal biasing magnetic field. It was revealed that the saturation field tends to decrease almost linear for the thick samples of hexaferrites upon increasing of their thickness. The experimental fact is compared to the calculations.

Primary authors: Mr NIKYTENKO, Artem (Taras Shevchenko National University of Kyiv); Mr KOSTENKO, Viktor (Taras Shevchenko National University of Kyiv); Prof. GRYGORUK, Valerii (Taras Shevchenko National University of Kyiv); Mr ROMANIUK, Vladyslav (Taras Shevchenko National University of Kyiv)

Presenter: Mr NIKYTENKO, Artem (Taras Shevchenko National University of Kyiv)

Track Classification: Physics of Magnetism

Contribution ID: 41

Type: **Poster**

INVESTIGATION OF THE OPTICAL PROPERTIES OF A BROKEN SURFACE LAYER OF PZT PIEZOCERAMICS MODIFIED BY HYDROGEN ATOMS

The optical properties of a broken surface layer of PZT piezoceramics modified by hydrogen atoms have been investigated. The phenomenon of an interference of light scattered on particles of the broken surface layer of PZT piezoceramics has been observed. Modification of the broken surface layer of PZT piezoceramics by hydrogen atoms leads to a partial spraying of the particles and an increase in their absorption coefficient, as a result, the intensity and thickness of the interference maxima decrease. Change of optical properties of a broken surface layer is a result of the ceramic reduction process with hydrogen atoms.

Primary author: Dr LUSHCHIN, Sergiy (Zaporizhzhye National Technical University)

Presenter: Dr LUSHCHIN, Sergiy (Zaporizhzhye National Technical University)

Track Classification: Laser Physics and Optoelectronics

Contribution ID: 42

Type: **Oral**

COMB FILTER BASED ON SAW-RESONATOR OF RUNNING WAVE

The construction and mathematical model of the comb filter on the basis of the ring resonator of the surface acoustic waves and two SAW-waveguides associated with the ring resonator at opposite points is proposed.

Primary authors: Mr ZHOVNIR, M.F. (Candidate of Technical Sciences, Senior Research Fellow of National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"); Prof. PYSARENKO, L.D. (Doctor of technical science); Ms PLESHKA, Tatiana (Student of National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute")

Presenter: Ms PLESHKA, Tatiana (Student of National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute")

Track Classification: Radio Engineering and Communications

Contribution ID: 43

Type: **Poster**

ELECTRONIC STRUCTURE AND OPTICAL PROPERTIES OF Li_2MoO_4 AND ZnMoO_4 CRYSTALS

The set of lithium molybdates Li_2MoO_4 crystals were made by the Czochralski (CZ) technique at different growing conditions. The electronic band structures of ZnMoO_4 and Li_2MoO_4 crystals were calculated by the Full-Potential Linear Augmented Plane Wave (FLAPW) method. Transmittance spectra of Li_2MoO_4 crystals reveal additional absorption bands near 370 nm. Calculations revealed different contributions from the cationic states (Li and Zn) to the electronic Conduction band of Li_2MoO_4 and ZnMoO_4 crystals, respectively.

Primary authors: HIZHNYI, Yuriy; NEDILKO, Serhii (Taras Shevchenko National University of Kyiv); Dr CHORNII, Vitalii (Taras Shevchenko National University of Kyiv); BORYSIUK, Viktor (Taras Shevchenko National University of Kyiv, Faculty of Physics, Chair of Optics)

Presenter: HIZHNYI, Yuriy

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: 44

Type: **Oral**

ESTIMATION OF THE LEVEL OF HIGH-FREQUENCY RADIATION OF A CELL PHONE

The level of electromagnetic radiation of a cell phone was estimated. It was shown that a person, talking on a cell phone daily for 2 hours, receives a radiation dose 100 times higher than the maximum permissible limit.

Primary authors: Mr SEIDAMETOV, Stanislav (Zaporozhye National Technical University); Mr SOLODOV, Vladislav (Zaporizhzhya National Technical University); Mr KOSTUSYAK, Yaroslav (Zaporizhzhya National Technical University)

Presenter: Mr SOLODOV, Vladislav (Zaporizhzhya National Technical University)

Track Classification: Medical Physics

Contribution ID: 45

Type: **Oral**

ADSORPTION CHARACTERISTICS OF Cr(VI) MOLECULAR ANIONS ON FUNCTIONALIZED CARBON NANOSTRUCTURES: A DFT INVESTIGATION

The Density Functional Theory (DFT)-based computations of the electronic structure of undoped, B- and N-doped CNT(3,3), CNT(5,5), six-walled CNT with (37,37) chirality of outer layer and graphene with adsorbed chromate anions were performed within molecular cluster approach. The CNT(5,5) with several surface groups including -COOH, -COO-, -OH and -NH₃⁺ were also considered as adsorbents in order to study the influence of functionalisation on the adsorption properties of the CNT-based materials with respect to toxic anions of hexavalent chromium Cr(VI). Relaxed geometries, binding energies and charge differences of the adsorbed chromate anions were calculated using B3LYP correlation functional. Doping with B substantially decreased (by ~1.5 – 2.5 eV), while doping with N increased (by ~2 – 4 eV) the absolute values of binding energies relatively to corresponding adsorption cases on undoped CNTs in vacuo. The negative binding energies values were obtained for adsorption of CrO₄²⁻ on functionalized CNTs in vacuo.

Primary author: BORYSIUK, Viktor (Taras Shevchenko National University of Kyiv, Faculty of Physics, Chair of Optics)

Co-authors: HIZHNYI, Yuriy; NEDILKO, Serhii (Taras Shevchenko National University of Kyiv)

Presenter: BORYSIUK, Viktor (Taras Shevchenko National University of Kyiv, Faculty of Physics, Chair of Optics)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 46

Type: **Oral**

COMPUTER SIMULATION OF SINGLE-ELECTRON NANO CIRCUITS

Proposed methods of modeling of electrical and temperature characteristics of single-electron transistor for providing information to system of computer-aided design Electronics Workbench. Analyzed dependence in current-voltage characteristics of nano-device through values of temperature and operating mode.

Primary author: Mr POLIAKOV, Yevhen

Co-authors: Prof. MELNYK, Oleksandr (National Aviation University, Kyiv, Ukraine, prosp.Kosmonavta Komarova 1, 03058); Mr KOSOV, Anton (National Aviation University, Kyiv, Ukraine, prosp.Kosmonavta Komarova 1, 03058)

Presenter: Mr POLIAKOV, Yevhen

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: 47

Type: **Oral**

COMPUTER-AIDED DESIGN OF NANOCIRCUIT FOR THE CRYPTOGRAPHIC DEVICES

The possibility of introducing non-emitting nanoscales on the basis of quantum cellular automata has been investigated. It practically neutralizes electromagnetic attacks. The method of protection from external interferences and observations of electromagnetic radiation (attacks) is proposed in the work. The power consumption of cryptographic modules has been reduced by five orders. Secure encryption of cryptographic information is provided.

Primary author: Mr MILKE, Denis (National Aviation University, prosp.Komonavta Komarova 1, Kyiv, Ukrain, 03058)

Co-authors: Mr KOSOV, Anton (National Aviation University, prosp.Komonavta Komarova 1, Kyiv, Ukrain, 03058); Prof. MELNYK, Oleksandr (National Aviation University, prosp.Komonavta Komarova 1, Kyiv, Ukrain, 03058)

Presenter: Mr MILKE, Denis (National Aviation University, prosp.Komonavta Komarova 1, Kyiv, Ukrain, 03058)

Contribution ID: 48

Type: **Poster**

STRUCTURAL DISORDER AND OPTICAL PROPERTIES OF ELECTON-IRRADIATED $\text{As}_2\text{S}_3(\text{Se}_3)$ CHALCOGENIDE GLASSES

Glassy chalcogenides of arsenium are characterized by high transparency in a near and middle infrared and belong to a class of materials which are used as active or passive elements in optical engineering. Experimental studies of the influence of radiation load (gamma radiation, X-radiation or electron radiation) enable to determine the character and change of physical properties of these materials, boundary doses of radiation, to learn the nature and mechanisms of radiational defect – formation, reveal conditions of renewing the initial parameters.

Primary author: SHPAK, Ivan (Uzhhorod National University)

Presenter: SHPAK, Ivan (Uzhhorod National University)

Track Classification: Laser Physics and Optoelectronics

Contribution ID: 49

Type: **Oral**

ACOUSTOELECTRONIC TRANSDUCERS OF DISPLACEMENTS WITH CONTACTLESS SENSITIVE ELEMENTS

The functional scheme and results of evaluation of potential metrological parameters of acoustoelectronic transducer (AET) displacements with contactless receiver of surface acoustic waves (SAW) are presented.

Primary authors: Mr ZHOVNIR, Nikolay (National Technical University of Ukraine “Kiev Polytechnic Institute”); Prof. PISARENKO, Leonid (National Technical University of Ukraine “Kiev Polytechnic Institute”); Mr BITOV, Miroslav (National Technical University of Ukraine “Kiev Polytechnic Institute”)

Presenter: Mr BITOV, Miroslav (National Technical University of Ukraine “Kiev Polytechnic Institute”)

Track Classification: Radio Engineering and Communications

Contribution ID: 51

Type: **Oral**

SIMULATION OF MICROWAVE PLASMA GENERATOR OF WAVEGUIDE-RESONATOR TYPE

Results of technological microwave plasma generator simulation based on Comsol Multiphysics environment are presented. Argon is used as working gas, microwave power of 300...700W. The method of generation based on microwave discharge of 2.45 GHz is researched.

Primary author: PEREVERTAILLO, Volodymyr

Co-author: Mr KUZMICHEV, Anatoly (National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute",)

Presenter: PEREVERTAILLO, Volodymyr

Track Classification: Plasma Physics

Contribution ID: 52

Type: **Oral**

IMPLEMENTATION OF THE INTERNET OF THINGS PRINCIPLE ON THE EXAMPLE OF THE HARDWARE-SOFTWARE COMPLEX FOR PSYCHODIAGNOSTIC, PSYCHOPHYSIOLOGICAL AND SOCIAL RESEARCHES

The model of the hardware-software complex to implement psychodiagnostic, psychophysiological and social researches is considered. The main tasks of the complex are determined. The structural scheme of the hardware-software complex is described.

Primary authors: Ms RALO, Anna (student); VARLAMOVA, Natalia; Mr STYERVOYEDOV, Nikolay

Presenter: Ms RALO, Anna (student)

Track Classification: Computer Engineering

Contribution ID: 53

Type: **Oral**

Charger based on magnetic suspension.

The work was aimed at demonstrating and quantifying how a permanent-magnet pulsed charger can provide a controlled charging process and user convenience. Our project is based on the “principle of magnetic suspension”, which provides the device a mode of continuous operation.

Primary author: Mr BLASHCHUK, Valentin (Tarasa Shevchenka)

Co-authors: Dr NIKITCHYN, Oleksandr (Tarasa Shevchenka); Dr IVANYUTA, Oleksandr (Tarasa Shevchenka)

Presenters: Mr BLASHCHUK, Valentin (Tarasa Shevchenka); Dr IVANYUTA, Oleksandr (Tarasa Shevchenka)

Track Classification: Radio Engineering and Communications

Contribution ID: 54

Type: **Oral**

Blashchuk model of transport platform

The publication was aimed at demonstrating and qualitative assessment of the transport platform, the work is based on electromagnetic suspension technology with a significant variation in its payload, bulk and wheel formula.

Primary author: Mr BLASHCHUK, Valentin (Tarasa Shevchenka)

Co-authors: Dr IVANYUTA, Oleksandr (Tarasa Shevchenka); Dr NIKITCHYN, Oleksandr (Tarasa Shevchenka)

Presenters: Mr BLASHCHUK, Valentin (Tarasa Shevchenka); Dr NIKITCHYN, Oleksandr (Tarasa Shevchenka)

Track Classification: Radio Engineering and Communications

Contribution ID: 55

Type: **Poster**

Effect of fluorine on structure and luminescence properties of some oxide compounds

The electronic band structure for set of fluorine-doped oxide as well for oxyfluoride crystals were calculated by the Full-Potential Linear Augmented Plane Wave method. Calculations showed that fluorine impurities do not generate any states near band edges, consequently fluorine does not participate in optical transitions directly. Influence of fluorine on crystal structure is resulted in elongation of cation-anion bonds and can lead to increasing of luminescence intensity.

Primary authors: Dr CHORNII, Vitalii (Taras Shevchenko National University of Kyiv); NEDILKO, Serhii (Taras Shevchenko National University of Kyiv); HIZHNYI, Yuriy; Dr TEREBILENKO, Kateryna (Taras Shevchenko National University of Kyiv); Prof. SLOBODYANIK, Mykola (Taras Shevchenko National University of Kyiv); Dr BOYKO, Volodymyr (National University of Life and Environmental Sciences of Ukraine)

Presenter: Dr CHORNII, Vitalii (Taras Shevchenko National University of Kyiv)

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: 56

Type: **Oral**

Helical Two-Stream Relativistic Electron Beam Parameters Influence on Space Charge Wave with Broad Frequency Spectrum Forming

We develop the cubic non-linear theory describing the dynamics of multiharmonic space charge wave (SCW), which harmonics frequencies are smaller than the two-stream instability critical frequency, with different relativistic electron beam (REB) parameters. The self-consistent differential equation system for multiharmonic SCW harmonic amplitudes was elaborated in a cubic non-linear approximation. We investigate the influence of different REB parameters such as the input angle with respect to focusing magnetic field, the average relativistic factor value, the difference of partial relativistic factors, the plasma frequency of partial beams on the frequency spectrum width and the multiharmonic SCW saturation levels. We suggest the ways of multiharmonic SCW frequency spectrum width increasing in order to use it in multiharmonic two-stream superheterodyne free-electron lasers which main purpose is to form a powerful multiharmonic electromagnetic wave.

Primary authors: Prof. LYSENKO, Alexander (Sumy State University); Mr VOLK, Iurii (Sumy State University)

Presenter: Mr VOLK, Iurii (Sumy State University)

Track Classification: Plasma Physics

Contribution ID: 57

Type: **Oral**

ANALYSIS OF ELECTRON TRAJECTORIES IN THE TWO-ELECTRODE SYSTEM OF A VACUUM CURRENT BREAKER WITH MAGNETIC CONTROL

The electron trajectories in the pulsed magnetic field between flat electrodes of vacuum circuit (current) breaker are numerically calculated taking into account the secondary magnetic field generated by eddy currents that are magnetically induced in the electrodes. It is revealed that the dimensions of the calculated region affect the calculation results of the edge electron trajectories beyond the inter-electrode gap and the electron cut-off conditions. The results obtained are applied to design vacuum interrupters and low-pressure discharge devices with magnetic control.

Primary author: Mr MAIKUT, Serhii (National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute")

Co-author: Dr TSIBULSKIY, Leonid (National Technical University of Ukraine «Igor Sikorski Kyiv Polytechnic Institute»)

Presenter: Mr MAIKUT, Serhii (National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute")

Track Classification: Plasma Physics

Contribution ID: 58

Type: **Oral**

DUTY CYCLE EFFECT ON UNIPOLAR MICROSECOND PULSED DISCHARGE IGNITION IN NITROGEN

This paper reports the results of studying the duty cycle effect on unipolar pulsed discharge ignition in low pressure nitrogen. In order to break down the gas with short voltage pulses (small duty cycle values) one ought to apply higher voltage values than those for long pulses with large duty cycle values. On increasing the duty cycle the breakdown voltage approaches the value corresponding to the ignition value of the dc glow discharge at the gas pressure given. On increasing the gas pressure the degree of duty cycle affecting the gas breakdown in the pulsed unipolar microsecond electric field weakens. At low pressure values (to the left of the breakdown curve minimum) and short voltage pulses a low-current mode appears (with the current growing during the pulse), and at higher voltage values one observes an abnormal pulsed discharge with a high current.

Primary authors: Prof. LISOVSKIY, Valeriy (V.N. Karazin Kharkov National University); Mr OSMAYEV, Ruslan; Mr PLATONOV, Pavel; Dr DUDIN, Stanislav; Prof. YEGORENKOV, Vladimir

Presenter: Prof. LISOVSKIY, Valeriy (V.N. Karazin Kharkov National University)

Track Classification: Plasma Physics

Contribution ID: 59

Type: **Poster**

LOW-POWER OPTICAL IRRADIATION INFLUENCE ON ALCOHOLS DROPLETS EVAPORATION PROCESSES

*In the report the experimental data according alcohols (*n*-propanol, *n*-butanol, *n*-pentanol, *n*-heptanol, *n*-octanol and *n*-decanol) droplets evaporation into gas-vapor mixture of droplet substance's vapor and buffer gas under optical irradiation influence were considered.*

Primary authors: Dr VERBINSKYA, Galyna (Taras Shevchenko National Kyiv University, Physics Faculty, Department of Molecular Physics); Dr BRYTAN, Andrii (Taras Shevchenko National Kyiv University, Physics Faculty, Department of Molecular Physics); Ms KOROBKO, Oksana (Taras Shevchenko National Kyiv University, Physics Faculty, Department of Molecular Physics); Prof. GAVRUSHENKO, Dmytro (Taras Shevchenko National Kyiv University, Physics Faculty, Department of Molecular Physics)

Presenter: Dr BRYTAN, Andrii (Taras Shevchenko National Kyiv University, Physics Faculty, Department of Molecular Physics)

Track Classification: Laser Physics and Optoelectronics

Contribution ID: 60

Type: **Poster**

TEMPERATURE STUDIES OF OPTICAL ABSORPTION EDGE IN $(\text{As}_2\text{S})_x(\text{As}_2\text{S}_3)_{1-x}$ ($x \leq 0.2$) SUPERIONIC GLASSES

As₂S₃ glassy semiconductor, due to the interesting photostimulated structural changes being revealed in their optical properties, has found wide practical applications as an efficient material for optical data recording, holography, integrated optics. Ag₂S-As₂S₃ chalcogenide glasses differ among the other by high conductivity, making them promising materials for solid state ionic. The present work is aimed at temperature studies of optical absorption edge in $(\text{Ag}_2\text{S})_x(\text{As}_2\text{S}_3)_{1-x}$ ($x \leq 0.2$) superionic glasses.

Primary authors: SHPAK, Oleksandr (Uzhhorod National University); Dr STUDENYAK, I. P. (Uzhhorod National University)

Presenter: SHPAK, Oleksandr (Uzhhorod National University)

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: 61

Type: **Oral**

MAGNETORESISTANCE OF FILMS BASED ON MAGNETIC AND NOBLE METALS AS SENSITIVE SENSOR ELEMENTS

The magnetoresistivity properties of films based on Fe and Pd or Au were studied. It was shown what character of the dependence and the amplitude of magnetoresistance are determined by the phase formation processes: the structural ordering in the films based on Fe and Pd or granulation in the films based on Fe and Au. Since the phase composition of the granules has a wide temperature and concentration stability, these film materials can be used as sensing elements of sensors of various functional appointment.

Primary authors: Prof. PROTSENKO, Ivan (Sumy State University); Mrs SHUMAKOVA , Maryna (Sumy State University); Prof. LARYSA, Odnodvoret (Sumy State University); Dr TKACH, Olena (Sumy State University)

Presenter: Dr TKACH, Olena (Sumy State University)

Track Classification: Physics of Magnetism

Contribution ID: 62

Type: **Poster**

SPEEDS OF THE EXCITED KALIUM ATOMS, DISSEMINATED AT IONIC BOMBING

By the method of Doppler tomography experimentally measured contours of the spectral line of potassium (kalium) ($\lambda = 766.5$ nanometer), the potassium radiated at dispersion of ions on the surface of silicon, in which phosphorus is insert. Sizes of speeds of the excited scattered particles which are flying away from a surface of a target are determined.

Primary authors: KUZMA, Vasyl (Uzhhorod National University); Prof. SHAFRANYOSH, Ivan (Uzhhorod National University); Dr KONOPLYOV, Aleksandr (Uzhhorod National University)

Presenter: Dr KONOPLYOV, Aleksandr (Uzhhorod National University)

Contribution ID: 63

Type: **Oral**

Films solid solution based on Fe and Ge as elements of microelectronics

In work the structure, phase composition and magnetoresistive properties of three-layer films based on Fe and Ge were investigated. Established in them with a total concentration of Ge atoms from 5 to 20 at.% at the temperature range 300 - 870 K is the formation of a dilute solid solution of Ge atoms in the layers of Fe, which does not substantially affect the value of the magnetoresistance and is related to the diffusion of Ge atoms in lattice α -Fe, decreasing the efficiency of the exchange interaction Fe atoms and disorder domain structure.

Primary author: Mr VLASENKO, Oleksandr (Sumy State University)

Co-authors: Mrs LOBODYUK, Olena (Sumy State University); Mrs RYLOVA, Anastasia (Sumy State University); Mrs SHUMAKOVA, Natalia (Sumy State University)

Presenter: Mr VLASENKO, Oleksandr (Sumy State University)

Track Classification: Physics of Magnetism

Contribution ID: 64

Type: **Poster**

APPLICATION OF WAVELET TRANSFORM FOR DENOISING OF X-RAY IMAGES IN DIGITAL RADIOGRAPHY

X-ray images denoising is an emerging problem in modern radiography systems. Purpose of present research was to investigate the efficiency of the application of wavelet transform for denoising x-ray images in digital radiography. The dependence of the SNR on major transform and filtration parameters was measured, namely wavelet type, thresholding method and threshold level selection way. Denoising results obtained from wavelet filtration were compared with the results of traditional noise filtration in fourier domain.

It was found that denoising quality strongly depends on the wavelet type, thresholding method and less depends on threshold magnitude. Reasonable selection of wavelet transform parameters for radiography image allowed to improve SNR about 40% while fourier domain filtration resulted in only 8% improvement of SNR.

Primary authors: Mr TROFYMOV, Pavlo (Taras Shevchenko National University of Kiev); Mr SENCHUROV , Sergiy (Taras Shevchenko National University of Kiev); Mr MOTOLYGA, Olexandr

Presenter: Mr TROFYMOV, Pavlo (Taras Shevchenko National University of Kiev)

Track Classification: Medical Physics

Contribution ID: 65

Type: **Oral**

ELECTRODE DIAMETER EFFECT ON STRUCTURE AND CHARACTERISTICS OF DC GLOW DISCHARGE IN NITROGEN

This paper reports the results of studying the electrode diameter effect on the structure and properties of the dc glow discharge in low pressure nitrogen. We demonstrate that the dependence of the voltage required to sustain the fixed current value against the inter-electrode distance is essentially affected by the electrode diameter. With small diameter electrodes a short positive column is observed whereas the length of the positive column increases considerably with increasing the electrode diameter. The current-voltage characteristics for large diameter electrodes run in the range of higher current and lower voltage values than those for small electrodes.

Primary authors: Prof. LISOVSKIY, Valeriy (V.N. Karazin Kharkov National University); Mr OSMAYEV, Ruslan; Mr KROL, Hennady; Prof. YEGORENKOV, Vladimir

Presenter: Mr KROL, Hennady

Track Classification: Plasma Physics

Contribution ID: 68

Type: **Poster**

INFLUENCE OF THE STRUCTURE TYPE ON THE GRAIN-BOUNDARY ENERGY OF SILICON FILMS

The relative grain-boundary energy of silicon films with equiaxed, dendritic and fibrous structure was determined by the method of grain boundary grooves with the use of atomic force microscopy. It was shown that undoped films with a dendritic structure possess the lowest relative grain-boundary energy; the largest relative energy was observed in fibrous structure. Annealing leads to the structure relaxation in phosphorus-doped dendritic silicon films.

Primary author: Dr RODIONOVA, Tatyana (Kiev National Taras Shevchenko University,)

Presenter: Dr RODIONOVA, Tatyana (Kiev National Taras Shevchenko University,)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 69

Type: **Poster**

PLASMADYNAMIC CONFIGURATIONS IN THE PLASMA STREAM, GENERATED BY MAGNETO-PLASMA COMPRESSOR

Investigation of characteristics of plasma streams, generated by different types of plasma accelerators and magneto-plasma compressors, is one of actual and important researches from point of view basic plasma dynamics and plasma applications in different technologists. It was demonstrated earlier, that near the MPC outlet there forms a stable compression zone, both theoretic and experimental results of plasma stream in the MPC channel were performed. The density and temperature on the inlet of accelerative channel in the self-compressed plasma stream greatly depend on the initial conditions.

Primary authors: Ms CHEREDNYCHENKO , Tatiana (Institute of Plasma Physics of the NSC KIPT); Prof. GARKUSHA , Igor (Institute of Plasma Physics of the NSC KIPT); Dr MAKHLAJ , Vadym (Institute of Plasma Physics of the NSC KIPT); Dr SOLYAKOV , Dmytro (Institute of Plasma Physics of the NSC KIPT); Mr PETROV , Yurii (Institute of Plasma Physics of the NSC KIPT); Mrs MARCHENKO , Ganna (Institute of Plasma Physics of the NSC KIPT); Mrs LADYGINA, Maryna (Institute of Plasma Physics of the NSC KIPT); Mr KULIK, Mykola (Institute of Plasma Physics of the NSC KIPT); Mr CHEBOTAREV, Volodymyr (Institute of Plasma Physics of the NSC KIPT); Mr YELISYEYEV, Dmytro (Institute of Plasma Physics of the NSC KIPT)

Presenter: Ms CHEREDNYCHENKO , Tatiana (Institute of Plasma Physics of the NSC KIPT)

Track Classification: Plasma Physics

Contribution ID: 70

Type: **Oral**

THE VERIFICATION OF DATA ON OPTICAL CHARACTERISTICS OF SEMICONDUCTORS BY THE KRAMERS-KRONIG ANALYZING

The report considers various approaches to using the Kramers-Kronig analysis in semiconductor optics. A new approach is proposed – the use of Kramers-Kronig relations to verify known data of well-known semiconductors. As the research has shown, many data require clarification. It was found that a greater deviation is observed for diatomic crystals than for monatomic crystals, like silicon and germanium, for example. The results of the work are useful for the practical application of optical data, in materials science, etc.

Primary author: KOZAK, Myroslav (Uzhhorod National University)

Presenter: KOZAK, Myroslav (Uzhhorod National University)

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: 71

Type: **Poster**

PLASMA RESEARCH AT THE UNIVERSITIES OF GREAT BRITAIN

The article analyzes plasma research at the universities of Great Britain. It examines modern trends in the research carried out by the experts in this field at top universities of Great Britain. The article touches upon the problem of specific plasma research areas.

Primary author: TYTOVA, Olena (Taras Shevchenko National University of Kyiv)

Presenter: TYTOVA, Olena (Taras Shevchenko National University of Kyiv)

Track Classification: Plasma Physics

Contribution ID: 72

Type: **Oral**

Computer simulation of a formal neuron based on analogue electronics devices

The hyperbolic tangent scheme based on analog components was investigated and improved by using the "NI Multisim" simulation environment. The application of the analogue circuit diagram of a hyperbolic tangent with a differential stage and the variation in the choice of transistors allows for a relative error of 10%.

Primary authors: Mr BEKH, Igor; Mr GRYNEVICH, Oleksandr; NOVAK, Sergii

Presenter: Mr GRYNEVICH, Oleksandr

Track Classification: Radio Engineering and Communications

Contribution ID: 73

Type: **Oral**

INFLUENCE OF PASTERIZATION METHODS ON THE MILK QUALITY

The technique non-destructive control of dairy products by methods spectroscopy in the processes its pasteurization offered. The object model was the development of software systems with the ability to control multi-threaded regulators with pasteurization and simulate its work to verify the correctness and operation of the technological process.

Primary author: Dr IVANYUTA, Oleksandr (Taras Shevchenko National University of Kiyv)

Presenter: Dr IVANYUTA, Oleksandr (Taras Shevchenko National University of Kiyv)

Track Classification: Medical Physics

Contribution ID: 74

Type: **Poster**

QUANTUM-CHEMICAL MODELING OF THE INTERACTION OF ARSENIC ATOM WITH VACANCY DEFECTS ON THE SiO₂/Si(100) SURFACE

Quantum-chemical calculations of the properties of a As atom implanted SiO₂/Si(100) interface are presented. For simulation of physicochemical properties and estimation of surfaces energy parameters semiempirical method of quantum-chemical modeling PM7 realized on MOPAC software package has been used. Dependencies of the total energy of a As atom cluster system on the location of As atom in oxygen and silicon vacancies are calculated, along with the geometric and electronic characteristics of the equilibrium cluster states with implanted arsenic atoms.

Primary author: TKACHENKO, Anatoliy

Presenter: TKACHENKO, Anatoliy

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 75

Type: **Poster**

3-DIMENSIONAL DESCRIPTION AND LATTICE DYNAMICS OF Cu₆PS₅Br SUPERIONICS

Within the framework of the superspace symmetry concept, the phonon spectra have been calculated for the crystal structure of the Cu₆PS₅Br superionic material.

Primary authors: Mrs SHTEYFAN, Alexina (Uzhhorod National University); Mr KATANYTSIA, Anton (Uzhhorod National University); Prof. NEBOLA, Ivan (Uzhhorod National University); Dr SIDEY, Vasyl (Uzhhorod National University)

Presenter: Dr SIDEY, Vasyl (Uzhhorod National University)

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: 76

Type: **Poster**

JOSEPHSON JUNCTIONS WITH TUNGSTEN NANORODS AS WEAK LINKS

We present a first step towards creation of a heterostructure with two superconducting leads and tungsten nanorods connecting them. We show that such a trilayer exhibits Josephson properties and thus realizes a superconducting junction with a spin-orbit active weak link. Specific features revealed in current-voltage curves of the junctions under microwave irradiation are caused by a resonant interaction of the Josephson generation with standing waves in the long junctions (the so-called zero-field steps).

Primary authors: SHATERNIK, Volodymyr (G.V.Kurdyumov Institute for Metal Physics of NAS of Ukraine); SHAPOVALOV, Andrii (V. Bakul Institute for Superhard Materials); Dr GRYB, Alexander (senior scientific worker); KHANENKO, Pavlo (student)

Presenter: SHAPOVALOV, Andrii (V. Bakul Institute for Superhard Materials)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 77

Type: **Poster**

MULTIMODE GAUSSIAN DECOMPOSITION OF RAMAN GAIN PROFILE IN P2O5-DOPED SILICA FIBER

Spectroscopic analysis of the Raman gain profile in P2O5-doped single-mode fiber is resulted in our paper. Raman gain profile is obtained from the measured spontaneous spectrum of P2O5-doped silica fiber and it is presented in analytic form using 12 mode Gaussian components. Almost the exact fitting of the gain spectrum over the wide range of Stokes shifted frequencies from 0 to 1400 cm^{-1} may be useful for design of variety nonlinear fiber devices such as the Raman fiber lasers and amplifiers.

Primary author: Ms SERDEHA, Irina (Taras Shevchenko National University of Kyiv)

Co-author: Dr FELINSKYI, G. (Taras Shevchenko National University of Kyiv)

Presenter: Dr FELINSKYI, G. (Taras Shevchenko National University of Kyiv)

Track Classification: Laser Physics and Optoelectronics

Contribution ID: 78

Type: **Poster**

REFORMING OF ETHANOL IN PLASMA-CATALYTIC SYSTEM WITH QUARTZ REACTION CHAMBER

Plasma-catalytic reforming of ethanol was investigated in a quartz reaction chamber. The composition of the reforming products was measured using mass spectrometry and gas chromatography. Results show that plasma-catalytic reforming can take place at significantly lower temperatures than traditional reforming. Emission spectra of plasma were investigated during plasma-catalytic reforming of ethanol in quartz reaction chamber. Oscillograms of the voltage and current of the rotating gliding discharge were investigated.

Primary authors: Dr NEDYBALIUK, Oleg (Taras Shevchenko National University of Kyiv); Prof. CHERNYAK, Valeriy (Taras Shevchenko National University of Kyiv); Mr FEDIRCHYK, Igor (Taras Shevchenko National University of Kyiv); DEMCHINA, Valentyna (Gas Institute of NASU)

Presenter: Mr FEDIRCHYK, Igor (Taras Shevchenko National University of Kyiv)

Track Classification: Plasma Physics

Contribution ID: 79

Type: **Oral**

EIGENPOLARIZATIONS ORTHOGONALITY CONDITIONS OF HOMOGENEOUS ANISOTROPIC MEDIA IN TERMS OF THE POLAR DECOMPOSITION THEOREM

Wednesday, 25 October 2017 14:30 (15 minutes)

The eigenpolarizations orthogonality conditions for homogeneous anisotropic media which Mueller matrix describes by the right and left polar forms have been obtained. The features of the relation between parameters of phase and amplitude anisotropy at which the eigenpolarizations are orthogonal have been analyzed. The Mueller matrix of arbitrary homogeneous anisotropic media with orthogonal eigenpolarizations in terms of the polar decomposition theorem was found. The identity of Mueller matrices for the right and left polar forms in the case of orthogonal eigenpolarizations has been shown.

Primary authors: Mr KURYLENKO, Roman; Mr KOLOMIETS, Ivan

Presenter: Mr KURYLENKO, Roman

Session Classification: Polarimetry: Theory and Applications

Track Classification: Polarimetry: Theory and Applications

Contribution ID: **80**

Type: **Oral**

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Primary author: Mr TEST, test

Contribution ID: **81**

Type: **Oral**

ASUS | Technology | Products

Wednesday, 25 October 2017 12:30 (30 minutes)

Primary authors: Mr NOSYKHIN, Bogdan (ASUS Inc.); Mr SHELEVEY, Ievgen (ASUS Inc.)

Presenter: Mr SHELEVEY, Ievgen (ASUS Inc.)

Contribution ID: 82

Type: **Oral**

EPAM: Engineer Culture as a Formula of Carrier Success

Wednesday, 25 October 2017 13:00 (30 minutes)

Primary author: Dr PACHABUT, Maxim (EPAM Ukraine)

Presenter: Dr PACHABUT, Maxim (EPAM Ukraine)

Contribution ID: **83**

Type: **not specified**

ROMSAT: From RPD to FRECS

Wednesday, 25 October 2017 13:30 (30 minutes)

Primary author: Mr VODOLAZ'KYI, Maksym (ROMSAT)

Presenter: Mr VODOLAZ'KYI, Maksym (ROMSAT)

Contribution ID: 84

Type: **Oral**

Discovery and Detection of Gravitational Waves

Thursday, 26 October 2017 10:40 (50 minutes)

Primary author: Prof. ZHDANOV, Valery (Taras Shevchenko National University of Kyiv)

Presenter: Prof. ZHDANOV, Valery (Taras Shevchenko National University of Kyiv)

Contribution ID: 85

Type: **not specified**

Vacuum Microwave Electronics in Ukraine and the Prospects for its Development

Thursday, 26 October 2017 11:30 (50 minutes)

Primary author: Dr DZYUBA, Valentyn (GE Factory "Generator")

Presenter: Dr DZYUBA, Valentyn (GE Factory "Generator")

Contribution ID: 86

Type: **Poster**

THE MEASUREMENT OF THE TEMPERATURE DRIFT OF THE MAGNETIC SENSITIVITY FOR THE HALL SENSOR

The annealing at the temperature of heat treatment of 403 K for the irradiated by the flow of electrons $\Omega=5\cdot 10^{15}$ el./cm², with the energy of 10 MeV, single crystals n-Ge was discovered. In this annealing, the magnetic sensitivity of the material had been increasing. The temperature drift of the magnetic sensitivity was studied and the analytical expression was obtained for finding of the magnitude of the magnetic induction in the temperature range from 245-300 K. This expression can be used to determine the magnetic induction based on obtained signals of the Hall voltage and the voltage of electrical conductivity of the magnetically sensitive element regardless of the measurement temperature in the above range.

Primary author: Dr LUNIOV, Sergiy (Lutsk National Technical University)

Co-authors: Mr ZIMYCH, Andriy (Lutsk National Technical University); Mr MEGELA, Ivan (Institute of electron physics NAS of Ukraine); Ms UDOVYTSKA, Julia (Lutsk National Technical University); Prof. MASLYUK, Volodymyr (Institute of electron physics NAS of Ukraine)

Presenter: Mr ZIMYCH, Andriy (Lutsk National Technical University)

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: 87

Type: **Poster**

Magnetodielectric coupling in pure and Dy-doped BiFeO₃ nanoparticles

Multiferroics invite intensive research from last decade because of their extensive range of interesting applications in high density data-storage systems, magnetoelectric sensors, multiple-state memories, nanoelectronics, spintronics. Bismuth ferrite (BiFeO₃), which is widely studied due to large coupling between electric and magnetic orders at room temperature, is promising for above said device applications. The existing literature does not shed clear light on what is going on with the crystal structure and ferroelectric, magnetic and magnetodielectric properties upon doping of BiFeO₃ with Dy. In this work, pure and Dy-doped BiFeO₃ nanoparticles synthesized by sol-gel method have been studied. This study establishes that strong magnetoelectric coupling in BiFeO₃ nanoparticles may be achieved with doping, and Dy-doped BiFeO₃ nanoparticles may prove to be useful in the development of nanoscale multiferroic-based devices.

Primary authors: Dr POLEK, Taras (Institute of Magnetism of the NAS of Ukraine and MES of Ukraine); Dr LOTEY, Gurmit (DAV University); Prof. VERMA, N. (Nano Research Lab, School of Physics and Materials Science); Prof. TOVSTOLYTKIN, Alexandr (Institute of Magnetism of the NAS of Ukraine and MES of Ukraine); Prof. POGORILY, Anatolyi (Institute of Magnetism of the NAS of Ukraine and MES of Ukraine)

Presenter: Dr POLEK, Taras (Institute of Magnetism of the NAS of Ukraine and MES of Ukraine)

Track Classification: Physics of Magnetism

Contribution ID: 88

Type: **Oral**

THE PROJECT OF A NETWORK OF AMATEUR TELESCOPES

As it is known, the first telescope was invented in 1609 by the Italian astronomer Galileo Galilei. By design, it resembled a regular telescope, but it was he who gave the first point to the study of celestial bodies. Since then, astronomy has advanced far ahead, as well as methods of observing celestial bodies. In addition to the optical range, a radio range with wavelengths from 1mm to 30 m is used. Such a wide range of wavelengths caused a large nomenclature of radio telescopes. This article considers the creation of a prototype of a radio telescope operating in the 10 GHz band and the urgency of creating such systems.

Primary author: Mr GRIGOROVICH, Michael

Co-author: Mr KLIMOV, Alexander

Presenter: Mr KLIMOV, Alexander

Track Classification: Radio Engineering and Communications

Contribution ID: 89

Type: **Poster**

OPTICAL FILTERS ON THE BASIS OF COMPOSITE SYSTEMS WITH NANODIMENSIONAL INCLUSIONS OF METALS

Numerical modeling of the electromagnetic response of the metal nanodimensional films and composite metal-dielectric systems formed on their basis was conducted in the wavelength range of 0.2 - 1.1 microns. A comparative analysis of the calculated and experimental data was presented. Influence of parameters of the studied composites on their electromagnetic response was shown.

Primary authors: Mr BABYCH, Bohdan; Dr MACHULYANSKY, Alexander; Mr MACHULYANSKY, Victor

Presenter: Mr BABYCH, Bohdan

Contribution ID: 90

Type: **Poster**

INELASTIC, ELASTIC PROPERTIES OF SiO₂, CaO, RADIATION CROSSLINKED HYDROGELS AND AUTOMATED SYSTEM "KERN-DP"

Bandages from the radiation cross-linked hydrogels show by itself elastic films with thickness $h = 2 \div 4 \cdot 10^{-3}$ m – transparent jelly sterile material, that with $C = 85 \div 90\%$ consists of distillate water. Such bandages for wounds for the grant of the urgent help at bleeding, burns must be biologically compatible and not stick to the wounds. They can contain antiseptic, anaesthetic, haemostatic. SiO₂, CaO as biocompatible are widely used in prosthesis and in implantology. Endoprosthetics - are the basic method of treatment of pathology of thurl, which allows to deliver a patient from claudication and pain. The software "KERN-DP" is developed for the automated system of anisotropy parameters analysis.

Primary author: Dr ONANKO, Anatoliy (Taras Shevchenko National University of Kyiv, faculty of physics, functional materials chair)

Co-authors: Prof. KULISH, Mykola (Taras Shevchenko National University of Kyiv, faculty of physics, functional materials chair); Dr ONANKO, Yuriy (Taras Shevchenko National University of Kyiv); Prof. VYZHVA, Sergiy (Taras Shevchenko National University of Kyiv); Dr CHARNYI, Dmitriy (Taras Shevchenko National University of Kyiv); Dr DMITRENKO, Oksana (Taras Shevchenko National University of Kyiv); Dr POLOVINA, Oleksiy (Taras Shevchenko National University of Kyiv)

Presenter: Dr ONANKO, Anatoliy (Taras Shevchenko National University of Kyiv, faculty of physics, functional materials chair)

Track Classification: Medical Physics

Contribution ID: 91

Type: **Oral**

THZ-FREQUENCY SPIN-HALL DETECTOR BASED ON ANTIFERROMAGNET

We demonstrate theoretically that a bi-layer structure consisting of a metallic layer with a strong spin-orbit (SO) interaction (such as Pt) and a layer of a bi-axial antiferromagnet (AFM), such as NiO, with weak easy-plane anisotropy can be a base of a THz-frequency signal detector with output DC signal generated due the THz-frequency spin-diode effect. Previously it was shown that such Pt/NiO structure biased by a DC current can generate output THz-frequency AC signal. Here we consider an inverse effect: the generation of a DC voltage across the structure under the action of THz-frequency AC signals. We theoretically compare influence of DC and AC currents flowing through the Pt layer on the magnetization dynamics in the AFM layer of the structure and show that detector's output voltage can exceed 1 mV.

Primary author: Ms VOT, Nataliia (Taras Shevchenko National University of Kyiv)

Co-author: Dr PROKOPENKO, Oleksandr (Taras Shevchenko National Unaversity of Kyiv)

Presenter: Ms VOT, Nataliia (Taras Shevchenko National University of Kyiv)

Track Classification: Physics of Magnetism

Contribution ID: 92

Type: **Poster**

USE OF SOLAR PANELS TO INCREASE THE TIME OF USE THE UAV

In today's world, there is an unlimited number of unmanned aerial vehicles (UAVs), they have proved themselves well in the field of entertainment and in military affairs. But so far they have a lot of problems. Not all UAVs can have the enough duration of the flight. The issue of UAVs with electric motors exploitation has been examined in the article.

Primary author: Ms LUNINA, Marharita

Co-author: Mr KLIMOV, Alexander

Presenter: Ms LUNINA, Marharita

Track Classification: Radio Engineering and Communications

Contribution ID: 93

Type: **Oral**

FTIR SPECTROSCOPY OF THE VANADATE NANOPARTICLES OF VARIOUS CATION COMPOSITIONS

The $\text{La}_{1-x}\text{Ca}_x\text{VO}_4$ and $\text{La}_{1-x-y}\text{Eu}_y\text{Ca}_x\text{VO}_4$ ($0 \leq x, y \leq 0.2$) micro/nanosized powders were prepared by aqueous nitrate-citrate sol-gel synthesis. Phase composition of the sample depends on the x, y values. Phase transformation and especially Ca^{2+} ions influence IR spectroscopy and luminescence behavior of studied compounds, as Ca^{2+} ions impact both on VO_4^{3-} molecular groups and La^{3+} and Eu^{3+} ions.

Primary author: SLEPETS, Alina (Taras Shevchenko National University of Kyiv)

Presenter: SLEPETS, Alina (Taras Shevchenko National University of Kyiv)

Track Classification: Laser Physics and Optoelectronics

Contribution ID: 94

Type: **Oral**

MATHEMATICAL MODEL OF AIRCRAFT LANDING WITH THE USE OF POLARIMETRIC MEASUREMENT SYSTEM

Wednesday, 25 October 2017 14:45 (15 minutes)

The paper deal with the questions of developing the mathematical model of aircraft landing with the use of polarimetric landing system. The paper describe process scheme of aircraft landing and the dependencies that describe the relationship between the measured polarimetric parameters and the parameters that describe the aircraft attitude and its deviation from the landing trajectory.

Primary authors: KLOCHAN, Arsen; Dr AL-AMMOURI, Ali; Mr ROMANENKO, Victor; Dr TRONKO, Vladimir; Mr VASILIEV, Dmitro; Prof. BIELIATYNSKYI , Andriy; Mr AL-AMMOURI, Hasan

Presenter: KLOCHAN, Arsen

Session Classification: Polarimetry: Theory and Applications

Track Classification: Polarimetry: Theory and Applications

Contribution ID: 95

Type: **Oral**

DECOMPENSATION OF THE CHARGES FIELDS OF AN OSCILLATING ATOMIC DIPOLE

In this paper we consider a model of a dipole with an atomic structure, instead of the standard dipole model with point unlike charges and the Hertzian dipole model, which have significant drawbacks. A functional formula is proposed for the dipole force that arises between different charges in the process of dipole oscillations and the decompensation of their fields.

Primary authors: VASYLENKO, Dmytro (Taras Shevchenko National University of Kyiv); Mr KRAVCHUK, Petro (Taras Shevchenko National University of Kyiv); Prof. GRYGORUK, Valerii (Taras Shevchenko National University of Kyiv); Dr SYDORENKO, Volodymyr (Taras Shevchenko National University of Kyiv)

Presenters: VASYLENKO, Dmytro (Taras Shevchenko National University of Kyiv); Mr KRAVCHUK, Petro (Taras Shevchenko National University of Kyiv)

Track Classification: Laser Physics and Optoelectronics

Contribution ID: 96

Type: **Poster**

Optimization of the construction of superachromatic quarter waveplates

Influence of design of multicomponent superchromatic quarter waveplates on the area of their achromatization and on the shape of the curve of the dependence of the phase shift vs the wavelength is investigated. Optimization of the design for five- and seven-component waveplates was carried out. It has been experimentally shown that insignificant changes in the angles of rotation of the optical axes of the internal components of the waveplates as compared to the theoretical ones lead to an expansion of the spectral range of achromatization of waveplates, to a change in the shape of the retardation curve, and to the shift of this dependence along the axis of ordinates.

Primary author: Mr SAMOYLOV, Anton

Presenter: Mr SAMOYLOV, Anton

Track Classification: Polarimetry: Theory and Applications

Contribution ID: 97

Type: **Oral**

SIMULATION OF WAVEFRONT FOCUSING THROUGH A SCATTERING MEDIUM

We demonstrated the possibility of the optical field focusing simulation into and behind the scattering medium using the wavefront shaping technique. The calculation of scattered fields was made with MSTM software which provides the exact numerical solution of the Maxwell equations for the system of spherical dielectric particles. Developed wavefront shaping algorithm allows investigating focusing in different planes while the focusing itself is made once in one of them. The properties of the focused spot were studied in four cases: focusing inside the target, just behind the target and at two positions far behind the target.

Primary authors: Mr DANKO, Oleksandr (Taras Shevchenko National University of Kyiv); Dr DANKO, Volodymyr (Taras Shevchenko National University of Kyiv); Dr KOVALENKO, Andrey (Taras Shevchenko National University of Kyiv); Dr KURASHOV, Vitalij (Taras Shevchenko National University of Kyiv)

Presenter: Mr DANKO, Oleksandr (Taras Shevchenko National University of Kyiv)

Track Classification: Laser Physics and Optoelectronics

Contribution ID: 98

Type: **Poster**

ON THE INFLUENCE OF ELECTRON VALENCY ON THE PROCESS OF THE CHANNELING OF HYDROGEN ATOMS IN CARBON NANOTUBES

The paper deals with the calculation of radial density of electrons in carbon nanotube of arbitrary hilarity. On this basis it is calculated the diffusion coefficient by the transverse energies, then the radial distribution of the channeling particles in the channel of CNT was calculated numerically.

Primary author: MAKSYUTA, Dmitro (Taras Shevchenko National University of Kyiv)

Co-authors: Dr MAKSYUTA, N.V. (Taras Shevchenko National University of Kyiv); Dr EFIMENKO, S.V. (Taras Shevchenko National University of Kyiv); Dr MARTYSH, Ye.V. (Taras Shevchenko National University of Kyiv); Dr VYSOTSKII, V.I. (Taras Shevchenko National University of Kyiv)

Presenter: MAKSYUTA, Dmitro (Taras Shevchenko National University of Kyiv)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 99

Type: **Oral**

KINETICS MODEL OF BREAKUP OF NANOWIRES AND NANOCONES INTO CHAINS OF NANOPARTICLES

A kinetic Monte Carlo approach is applied to studying shape instability of nanowires and nanocones that results in their breaking up into chains of nanoparticles. Our approach can be used to explore dynamical features of the process that correspond to experimental findings, but that cannot be interpreted solely by continuum modeling reminiscent of the description of the Plateau-Rayleigh instability in liquid jets. For example, we observe long-lived dumbbell-type fragments and other typical non-liquid-jet characteristics of the process, as well as confirm the observed lattice orientation dependence of the breakup process of single-crystal nanowires. We provide snapshots of the process dynamics, and elaborate on the nanowire-end effects, as well as on the morphology of the resulting nanoparticles.

Primary author: Mr TERESHCHUK, Volodymyr (National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”)

Co-author: Prof. GORSHKOV, Vyacheslav (National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”)

Presenter: Mr TERESHCHUK, Volodymyr (National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 100

Type: **Poster**

Voice embedding method for speaker recognition task

Most cognitive services deal with voice understanding of emotions, speech and speaker recognition. Thus, the actual problem is creating a general approach for speech embedding, such as speaker recognition. The state-of-the-art speaker recognition methods have significant restrictions on their use because these methods are sensitive to durations of the speech signals. In this paper, we've proposed a new approach to the speech signals embedding using a recurrent neural network, which can be used for the speaker, speech and emotion recognition. It has been shown experimentally that the use of the proposed approach allowed to reduce the speaker recognition error equal rate by 7.5% compared with the state-of-the-art «i-vector» approach with voice models vector dimension 16 and 100, respectively, for 2 sec. speech signals.

Primary author: KORNIENKO, Oleksandr (Ph.D student. National Technical University of Ukraine”Igor Sikorsky Kyiv Polytechnic Institute”)

Presenter: KORNIENKO, Oleksandr (Ph.D student. National Technical University of Ukraine”Igor Sikorsky Kyiv Polytechnic Institute”)

Track Classification: Computer Engineering

Contribution ID: **101**Type: **Oral**

MODELING OF HEATING AND ACCELERATION OF NANOPARTICLES IN A PLASMA JET

The heating of dust nanoparticles in a plasma jet and its effect on their velocity are studied using the computer simulation. It is shown that at plasma pressures at the inlet $p=1-100$ Torr dust particles are strongly heated in the plasma, and the temperature of the dust particles depends on their radius and plasma density. In the case of a rarefied plasma, small particles acquire a higher temperature, and in the case of a denser plasma the temperature of larger particles is higher. The latter effect is associated with the significant role of energy exchange of dust particles with neutral atoms in the case of a denser plasma and small particles.

Primary authors: Dr KRAVCHENKO, Oleksandr (Dozent); Mr MARUSCHAK, Ivan (Engineer)

Presenter: Dr KRAVCHENKO, Oleksandr (Dozent)

Track Classification: Plasma Physics

Contribution ID: 102

Type: **Oral**

POLARIZATION PROPERTIES OF ANISOTROPIC MEDIA WITH SINGULAR EIGENPOLARIZATION: GENERALIZED MATRIX EQUIVALENCE THEOREME APPROACH

Wednesday, 25 October 2017 15:00 (15 minutes)

The polarimetric inverse spectral problem for class of media with singular eigenpolarizations (linear and circular) in terms of Generalized equivalence theorem approach was solved. The cases of phase and amplitude eigenvalues were considered. Two different bases of Generalized equivalence theorem were observed. The types of anisotropy and the values of anisotropy parameters that provide the specified cases of singular eigenpolarizations were determined.

Primary author: Mr SITNICHENKO, A.O. (Taras Shevchenko National University of Kyiv)

Co-authors: KOLOMIETS, Ivan; Dr OBEREMOK, Ye. A. (Taras Shevchenko National University of Kyiv); Prof. SAVENKOV, S. N. (Taras Shevchenko National University of Kyiv)

Presenter: Mr SITNICHENKO, A.O. (Taras Shevchenko National University of Kyiv)

Session Classification: Polarimetry: Theory and Applications

Track Classification: Polarimetry: Theory and Applications

Contribution ID: 103

Type: **Poster**

Referenceless wavefront reconstruction with the Talbot sensor

A methods of the restoring the optical wave front by the gradient sensor without a reference wave are discussed. The main idea is the comparison the grating images in the two successive Talbot planes. Results, obtained for the optical band are proposed to expand in the range of shorter wavelength.

Primary authors: BRAZHNIKOV, Denis (Taras Shevchenko National University of Kyiv); Mr KOTOV, Myhailo (Taras Shevchenko National University of Kyiv); Dr KURASHOV, Vitalij (Taras Shevchenko National University of Kyiv); DANKO, Volodymyr (Taras Shevchenko National University of Kyiv)

Presenter: BRAZHNIKOV, Denis (Taras Shevchenko National University of Kyiv)

Track Classification: Laser Physics and Optoelectronics

Contribution ID: **104**

Type: **Oral**

THE INFLUENCE OF A MAGNETIC FIELD ON THE MICROHARDNESS OF THE TITANIUM ALLOY VT3-1

The influence of a permanent magnetic field on the relaxation of microhardness of the titanium alloy VT3-1 over time was found. The limited value of the magnetic field induction at which the maximum effect is observed was determined.

Primary authors: Mr SEIDAMETOV, Stanislav (Zaporozhye National Technical University); Prof. LOSKUTOV, Stepan (Zaporozhye National Technical University)

Presenter: Mr SEIDAMETOV, Stanislav (Zaporozhye National Technical University)

Track Classification: Physics of Magnetism

Contribution ID: 105

Type: **Oral**

PHOTOCATALYTIC PROPERTIES OF TITANIA FORMED ON POROUS ANODIC ALUMINA BY SOL-GEL METHOD

Titania was formed in the pores and on the surface of porous anodic alumina by sol-gel method. Its photocatalytic activity is seven times higher than those formed on non-porous surfaces (aluminum foil).

Primary authors: BAGLOV, Aleksey (Belarusian State University of Informatics and Radioelectronics (BSUIR)); KHOROSHKO, Liudmila (Belarusian State University of Informatics and Radioelectronics (BSUIR))

Presenter: BAGLOV, Aleksey (Belarusian State University of Informatics and Radioelectronics (BSUIR))

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 106

Type: **Oral**

FILM SOLID SOLUTION BASED ON Fe AND Ge AS ELEMENTS OF MICROELECTRONICS

In work the structure, phase composition and magnetoresistive properties of three-layer films based on Fe and Ge were investigated. Established in them with a total concentration of Ge atoms from 5 to 20 at.% at the temperature range 300 - 870 K is the formation of a dilute solid solution of Ge atoms in the layers of Fe, which does not substantially affect the value of the magnetoresistance and is related to the diffusion of Ge atoms in lattice Fe, decreasing the efficiency of the exchange interaction Fe atoms and disorder domain structure.

Primary authors: Mr VLASENKO, Olexander (Sumy State University); Mrs LOBODYUK, Olena (Sumy State University); Mrs RYLOVA, Anastasiya (Sumy State University); Ms SHUMAKOVA, Nataliya (Sumy State University)

Presenter: Mr VLASENKO, Olexander (Sumy State University)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 107

Type: **Oral**

SIMULATION OF CURRENT-VOLTAGE CHARACTERISTICS OF LARGE-AREA JOSEPHSON JUNCTIONS AND SPACE-TIME DYNAMICS FOR VARIOUS VORTEX-FLOW MODES

High-frequency applications of Josephson contacts require single-valued current-voltage characteristics which are usually achieved by using an external low-resistance normal-metal shunt in parallel with each junction. In this contribution, we propose a new approach for realizing internal shunting in Josephson heterostructures where a barrier itself contains the desired resistive component. We also study the space-time vortex-flow dynamics in elongated Josephson junctions by solving the related sine-Gordon equation with a Baecklund transformation.

Primary author: Dr TKACHENKO, Vera (Vasyl' Stus Donetsk National University)

Co-authors: BELOGOLOVSKII, Mikhail (G.V. Kurdyumov Institute for Metal Physics, National Academy of Sciences of Ukraine); Dr BARYBIN, Oleksii (Vasyl' Stus Donetsk National University)

Presenter: Dr TKACHENKO, Vera (Vasyl' Stus Donetsk National University)

Contribution ID: **108**Type: **Oral**

REFRACTIVE PROPERTIES OF LiNaSO₄ SINGLE CRYSTAL

In this work first principles calculations of dielectric function of LiNaSO₄ single crystals are performed in the framework of density functional theory. In order to describe the exchange-correlation interaction the general gradient approximation and local density approximation are used. From the spectrum of real and imaginary parts of dielectric function, refractive indices and absorption coefficients are obtained. Experimental study of refractive indices dispersion and birefringence of LiNaSO₄ crystals is performed using standard immerse and spectroscopic methods.

Primary authors: Mr SHCHEPANSKYI, Pavlo (Ivan Franko National University of Lviv); Mr RUDYSH, Myron (Ivan Franko National University of Lviv); Prof. STADNYK, Vasyl (Ivan Franko National University of Lviv); Dr BREZVIN, Ruslan (Ivan Franko National University of Lviv)

Presenter: Mr SHCHEPANSKYI, Pavlo (Ivan Franko National University of Lviv)

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: **109**

Type: **Oral**

ELECTRONIC and OPTICAL PROPERTIES of Ag₂SiS₃ CHALCOGENIDE CRYSTAL: DFT STUDY

This study is devoted to first principles study of Ag₂SiS₃ semiconductor crystal. The Electronic structure, and optical properties will be presented.

Primary authors: Mr RUDYSH, Myron; SHCHEPANSKYI, Pavlo; Prof. STADNYK, Vasyl (Ivan Franko National University of Lviv); Prof. BRIK, Mikhail; Dr FEDORCHUK, Anatolii; Dr PIASECKI, Michal

Presenter: Mr RUDYSH, Myron

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: 110

Type: **Poster**

PropeRties OF REGULAR STRUCTURES FOR PMC Diagnosis MODELS

Some important properties of PMC system-level diagnosis model are discussed. System-level diagnosis aims at the identification of faulty units in a self diagnosable distributed systems for elimination, repairing or recovering of these units. Fault identification in this system in great extent depends on the number of fault patterns under given system syndrome. Complexity of such analysis define the whole productivity of diagnosi. Some new of these complexity evaluations are given in this work.

Primary author: Dr KOVALENKO, Anatoly (Institute for Applied System Analysis of NTUU “Igor Sikorsky Kyiv Polytechnic Institute”)

Presenter: Dr KOVALENKO, Anatoly (Institute for Applied System Analysis of NTUU “Igor Sikorsky Kyiv Polytechnic Institute”)

Track Classification: Computer Engineering

Contribution ID: 111

Type: **Poster**

Spectrophotometric Control Oxidation - Reduction - Potential (ORP) Of Water

Primary authors: VASYLYUK, Svetlana (Taras Shevchenko National University of Kyiv); Dr MYAGCHENKO, Yuriy (Taras Shevchenko National University of Kyiv)

Presenter: VASYLYUK, Svetlana (Taras Shevchenko National University of Kyiv)

Track Classification: Laser Physics and Optoelectronics

Contribution ID: 112

Type: **Poster**

EFFECT OF HEAT TREATMENT ON THE MAGNETIC PROPERTIES AND STRUCTURAL TRANSFORMATIONS OF LOW-ALLOY STEELS OF THE PEARLITE CLASS

The paper presents the results of a study of the effect of quenching and subsequent tempering on the magnetization of steels.

Primary authors: Mr NEDYBALIUK, Anatolii (Vinnytsia National Technical University); Dr ATAMANIUK, V.V. (Vinnytsia State Pedagogical University named after Mykhailo Kotsiubynsky); Prof. KASIYANENKO, Vasyl (Vinnytsia National Technical University)

Presenter: Mr NEDYBALIUK, Anatolii (Vinnytsia National Technical University)

Track Classification: Physics of Magnetism

Contribution ID: 113

Type: **Oral**

POLARIMETRIC MODELING AND CALIBRATION OF THE MULTI-SPECTRAL IMAGER POLARIMETER (MSIP) FOR AEROSOL-UA SPACE MISSION

Wednesday, 25 October 2017 15:15 (15 minutes)

We develop the polarimetric model and ground-based calibration approach for the multi-spectral imager-polarimeter (MSIP), which is one of the two main instruments for the Aerosol-UA space mission [1]. MSIP is a polarimeter that serves to retrieve the optical and physical characteristics of the aerosol, as well as the cloud parameters with wide field of view. MSIP will perform measurements of three Stokes parameters I, U, Q of the atmosphere and Earth-scattered solar radiation from a Sun-synchronous orbit in three spectral channels with polarization (410, 555 and 865 nm) and two channels without polarization that splitted to eight wavebands (410, 443, 470, 490, 555, 670, 865, and 910 nm). To describe polarization systems, we use self-consistent Stokes-Mueller formalism.

Primary authors: Dr OBEREMOK, Ye. A. (Taras Shevchenko National University of Kyiv); Mr KOLOMIETS, Ivan; Dr MILINEVSKY, G (Main Astronomical Observatory of National Academy of Sciences of Ukraine, Ukraine); Mr SYNIAVSKY, I (Main Astronomical Observatory of National Academy of Sciences of Ukraine, Ukraine); Prof. SAVENKOV, S. N. (Taras Shevchenko National University of Kyiv); Mr CHAYKA, V (Taras Shevchenko National University of Kyiv)

Presenter: Dr OBEREMOK, Ye. A. (Taras Shevchenko National University of Kyiv)

Session Classification: Polarimetry: Theory and Applications

Track Classification: Polarimetry: Theory and Applications

Contribution ID: 114

Type: **Oral**

ARDUINO-BASED AUTOMATED SYSTEM FOR MEASUREMENT AND MANAGEMENT OF MICROWAVE SIGNAL POWER LEVEL

The work demonstrates a possibility of modernization and expansion of the obsolete radio measuring apparatus capabilities with the use of a modern Arduino-based electronics. The automation project for the polarization attenuator in the C-band is based on the AVR ATmega microcontroller. The proposed system not only allows one to automatically measure and control the power of microwave signals, but also claims to mass design and production as a separate measuring unit for modern systems of processing and analyzing information in the C-band.

Primary authors: MOISEIENKO, Vladislav; BELIMENKO, Roman; Prof. PROKOPENKO, Oleksandr

Presenter: BELIMENKO, Roman

Track Classification: Computer Engineering

Contribution ID: 115

Type: **Poster**

INFLUENCE OF CsCl ADDITIVES ON NANOVOIDS AND OPTICAL PROPERTIES OF 80GeS₂-20Ga₂S₃ GLASSES

Influence of CsCl additives on the transformation of nanovoids and optical properties of chalcogenide GeS₂-Ga₂S₃ glasses are investigated. It is established that CsCl additives in GeS₂-Ga₂S₃ glasses result in void agglomeration and shift of the absorption edge towards shorter wavelengths.

Primary author: KLYM, Halyna (Lviv Polytechnic National University)

Presenter: KLYM, Halyna (Lviv Polytechnic National University)

Contribution ID: 116

Type: **Poster**

MODERN POSSIBLE APPLICATION OF DBD SPECIAL DISCHARGE

Dielectric-barrier discharges (DBD) are characterized by the presence of one or more insulating layers on the current path between metal electrodes in addition to the discharge space. Different planar or cylindrical configurations are common. Closely related are surface discharge configurations in which discharges are initiated at a dielectric surface due to strong electric fields generated by imbedded metal electrodes. The presence of the dielectric(s) precludes DC operation. Although DBD configurations can be operated between line frequency and microwave frequencies the typical operating range for most technical DBD applications lies between 500 Hz and 500 kHz. The creation of biodegradable polymer materials with high biocompatibility, which perform a temporary function and decompose in the body is the subject of future research.

Primary author: PRYSIAZHNA, Olena (Taras Shevchenko National University of Kyiv)

Co-author: Prof. MARTYSH, E.V. (Taras Shevchenko National University of Kyiv)

Presenter: PRYSIAZHNA, Olena (Taras Shevchenko National University of Kyiv)

Track Classification: Medical Physics

Contribution ID: 117

Type: **Oral**

VOLTAGE FLUCTUATIONS CAUSED BY FEEDING SINGLE POWERFUL PULSES IN "SILICON STRUCTURES WITH DIELECTRIC ISOLATION"

The silicon structures with dielectric insulation are having voltage fluctuations under single powerful current pulses. It is shown that the heating of the structure reaches such values that there is a negative differential conductivity in the overheating mechanism, which leads to the occurrence of voltage fluctuations.

Primary authors: Mr PAVLYUK, S (Taras Shevchenko National University of Kyiv); Prof. GRYGORUK, Valerii; Mrs ISCHUK, I (Taras Shevchenko National University of Kyiv); TELEGA, Volodymyr; Mr KOVTOK, V (Taras Shevchenko National University of Kyiv); Mr VAKYLYAK, Ye

Presenter: Mr VAKYLYAK, Ye

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: 118

Type: **Oral**

ON VAN DER WAALS INTERACTION BETWEEN TWO CONDUCTING FINITE-LENGTH NANOWIRES WITH MIRROR-LIKE ARRANGEMENT

Van der Waals interactions between nanoparticles have recently become area of the great interest. They govern the way in which nanoparticles self-assembly into ordered structures [1-3] and play significant role in catalysis and nanomechanics. Interactions between infinite-length nanowires are well studied [4-5], but there is lack of works which examine finite-length nanowires. Our previous study [6] used Luttinger liquid model [7] and was focused on van der Waals interactions between conducting finite-length nanowire and the surface. In this work we use same approach to examine how van der Waals energy between two conducting finite-length nanowires with same size and mirror-like arrangement depend on distance to length ratio.

Primary authors: MAKHNOVETS, Kateryna (Taras Shevchenko National University of Kyiv, Institute of High Technologies); KOLEZHUK, Oleksiy (Institute of High Technologies)

Presenter: MAKHNOVETS, Kateryna (Taras Shevchenko National University of Kyiv, Institute of High Technologies)

Track Classification: Surface Physics, Nano- and Microelectronics

Contribution ID: 119

Type: **Poster**

TECHNOLOGICALLY-MODIFIED $\text{Cu}_{0.1}\text{Ni}_{0.8}\text{Co}_{0.2}\text{Mn}_{1.9}\text{O}_4$ CERAMIC: POSITRON ANNIHILATION LIFETIME SPECTROSCOPY AND DEGRADATION STUDIES

The $\text{Cu}_{0.1}\text{Ni}_{0.8}\text{Co}_{0.2}\text{Mn}_{1.9}\text{O}_4$ ceramics modified by NiO phase were investigated. It is established that the amount of additional NiO phase in these ceramics extracted during sintering play a decisive role. This effect is well revealed only in ceramics having a character fine-grain microstructure, while the monolithization of ceramics caused by great amount of transferred thermal energy reveals an opposite influence. The process of monolithization from the position of evolution of grain-pore structure was studied in these ceramics using positron annihilation lifetime spectroscopy.

Primary author: KLYM, Halyna (Lviv Polytechnic National University)

Co-authors: Dr KOSTIV, Yuriy; Dr VASYLCHYSHYN, Ivanna

Presenter: KLYM, Halyna (Lviv Polytechnic National University)

Track Classification: Physics of Semiconductors and Dielectrics, Semiconductor's Devices

Contribution ID: 120

Type: **Oral**

STUDY OF PARAMETERS OF POLYCRISTAL FERRITE SAMPLES BY RADIOSPECTROMETER

In this work an experimental study of samples of polycrystalline ferrites-garnets is conducted in order to determine their basic magnetic parameters. The method allows determine the magnetization of saturation, the width of lines of ferromagnetic resonance, the magneto-mechanical ratio. The applicability of the method for disk samples of different diameters and thickness is shown. The results of the work can be used for the development of the technology of obtaining ferrite materials.

Primary authors: Dr KOBLJANSKYJ, Yu. (Taras Shevchenko National University of Kyiv); Mr KONDRATOVYCH, Yu. (Taras Shevchenko National University of Kyiv); Mr MARTYNCHYK, Yu. (Taras Shevchenko National University of Kyiv)

Presenter: Dr KOBLJANSKYJ, Yu. (Taras Shevchenko National University of Kyiv)

Track Classification: Physics of Magnetism

Contribution ID: 121

Type: **Oral**

RELAXATION OF DOMAIN WALLS IN ULTRATHIN MAGNETIC FILMS

We consider a motion of homochiral domain walls in asymmetric CrO_x/Co/Pt trilayers, induced by an external magnetic field applied perpendicularly to the sample plane. We demonstrate that the longitudinal contribution to viscosity of a domain wall may play a significant role and in some regimes dominates the dynamic of a domain wall.

Primary authors: Dr YASTREMSKY, Ivan (Taras Shevchenko National University of Kiev); Dr MAKAROV, Denis (Helmholtz-Zentrum Dresden-Rossendorf e.V., Institute of Ion Beam Physics and Materials Resea)

Presenter: Dr YASTREMSKY, Ivan (Taras Shevchenko National University of Kiev)

Track Classification: Physics of Magnetism

Contribution ID: 122

Type: **Oral**

SPIN WAVES PROPAGATION IN CURVED ANTIFERROMAGNETIC NANOWIRES: RING AS A CASE OF STUDY

Here we theoretically investigate spin waves excitations in antiferromagnetic spin chain of ring shape. We show that such system's ground magnetization distribution is oriented along normal to the ring plane direction. The spin wave spectrum of ring forms four different asymmetric branches.

Primary authors: Mr KONONENKO, Denys (Taras Shevchenko National University of Kyiv); Dr PYLYPOVSKYI, Oleksandr (Taras Shevchenko National University of Kyiv); Prof. GAIDIDEI, Yuri (Bogolyubov Institute for Theoretical Physics); Prof. SHEKA, Denis (Taras Shevchenko National University of Kyiv)

Presenter: Mr KONONENKO, Denys (Taras Shevchenko National University of Kyiv)

Track Classification: Physics of Magnetism

Contribution ID: 123

Type: **Oral**

Too many magnets

There was a task at the International Physicists' Tournament in 2017: "How many magnets can be accommodated within a given surface area before the structure collapses and the magnets stick together? How does the maximal area number density of magnets depend on the important parameters?". This report describes the process of emergence of the instability in the configuration of the magnets, that are on the plane, and the reasons of their collapse. Theoretically we have found a safe distance at which magnets can be placed, and their density that depends on the parameters of the magnets was found, too.

Primary author: KIZILOV, Mykyta (V.N. Karazin Kharkiv National University)

Presenter: KIZILOV, Mykyta (V.N. Karazin Kharkiv National University)

Track Classification: Physics of Magnetism

Contribution ID: 124

Type: **Oral**

NANO-PARTICLES PRODUCTION AT SECONDARY DISCHARGE PLASMA-LIQUID SYSTEMS WITH VORTEX AR FLOW

The paper presents the results of nano-particles production in two different atmospheric pressure plasma-liquid systems with the secondary discharge based on rotating discharges in vortex argon flow. The treated by plasma working fluids were aqueous solutions of AgNO₃ with addition of different concentrations of surface active substances. The resulting samples after the plasma treatment were studied by emission absorption methods and atomic force microscope.

Primary author: KOLOMIETS, Oksana (Taras Shevchenko National University of Kyiv)

Co-authors: Prof. CHERNYAK, V.Ya. (Taras Shevchenko National University of Kyiv); Dr IUKHYMENKO, V.V. (Taras Shevchenko National University of Kyiv); Dr NEDYBALIUK, O.A. (Taras Shevchenko National University of Kyiv); Mr IUKHYMENKO, K.V. (Taras Shevchenko National University of Kyiv); Mr FEDIRCHYK, I.I. (Taras Shevchenko National University of Kyiv); Mr LENDIEL, V.V. (Taras Shevchenko National University of Kyiv); PRYSIAZHNA, Olena (Taras Shevchenko National University of Kyiv); SAMCHENKO, Y. (F.D. Ovcharenko Institute of Biocolloidal Chemistry NAN Ukraine); PASMURCEVA, N. (F.D. Ovcharenko Institute of Biocolloidal Chemistry NAN Ukraine); POLTORACKA, T. (F.D. Ovcharenko Institute of Biocolloidal Chemistry NAN Ukraine); KERNOSENKO, L. (F.D. Ovcharenko Institute of Biocolloidal Chemistry NAN Ukraine)

Presenter: KOLOMIETS, Oksana (Taras Shevchenko National University of Kyiv)

Track Classification: Plasma Physics

Contribution ID: 125

Type: **Oral**

ELECTRIC AND EMISSION PROPERTIES OF MULTI-SPARK AERODYNAMICAL ACTUATOR

Actuators are specially constructed device mounted on an airfoil with the aim to enhance aerodynamic properties. This work is devoted to properties investigation of spark plasma actuators, where discharge occurs between 40 aligned steel or copper electrodes on insulating surface. The actuator supplies by high voltage generator in pulse mode with frequency till to 1000 Hz.

Primary authors: LEBED, Anton (KNU); Dr BORETSKIJ, V (KNU)

Presenter: LEBED, Anton (KNU)

Track Classification: Plasma Physics

Contribution ID: 126

Type: **Oral**

The eigenvalue method for calibration of Mueller-polarimeter on LCD cells

Wednesday, 25 October 2017 15:30 (15 minutes)

In this work the eigenvalue method for calibration of Mueller-polarimeters is described. This method is completely mathematical and abstracted from the physical nature of the polarization state generator (PSG) and the polarimeter (analyser, PSA). In this method, the PSG and the polarimeter are represented by their hardware 4×4 matrices W and A , respectively, and their 32 coefficients are determined from three or four measurements performed on reference samples. Those references are smooth isotropic samples and perfect linear polarizers. Their optical characteristics are unambiguously determined during the calibration from the eigenvalues of the measured matrices.

Primary authors: RYABOKRYS, Pavlo; Dr OBEREMOK, Ye. A. (Taras Shevchenko National University of Kyiv); KOLOMIETS, Ivan

Presenter: RYABOKRYS, Pavlo

Session Classification: Polarimetry: Theory and Applications

Track Classification: Polarimetry: Theory and Applications

Contribution ID: 127

Type: **Oral**

Structural organization of murine 6-phosphofructo-2-kinase/fructose-2,6-bisphosphatase 2 and its isoforms

In this paper we provide novel molecular models of murine bi-functional enzyme 6-phosphofructo-2-kinase/fructose-2,6-bisphosphatase 2 and its five isoforms. Molecular 3-dimensional models were designed in silico via method of homological biomolecular modeling.

Primary authors: Mr KONONENKO, Artem (Taras Shevchenko National University of Kyiv); Prof. MINCHENKO, Olexandr (Palladin Institute of Biochemistry of the National Academy of Sciences of Ukraine)

Presenter: Mr KONONENKO, Artem (Taras Shevchenko National University of Kyiv)

Track Classification: Medical Physics

Contribution ID: 128

Type: **Oral**

FID SIGNAL ALGORITHM AND INTERPOLATION TECHNIQUE FOR SUPER-RESOLUTION MR IMAGING

There are many super-resolution techniques have been successfully used in magnetic resonance imaging. Those techniques make possible to obtain SR images after acquisition has been performed. The new algorithm for measured FID signal for data estimation in k- space and interpolation technique for obtaining super resolution images is proposed. The proposed technique is to increase the spatial resolution of low resolution images and decrease the scanning time.

Primary authors: Dr NETREBA, Andrii; Dr NAGULIAK, Oleg

Presenter: Dr NAGULIAK, Oleg

Track Classification: Medical Physics