International Conference PhysicA.SPb/2017

Journal of Physics: Conference Series Volume 1038

St. Petersburg, Russia 24 - 26 October 2017

Editors:

Nikita S. Averkiev Sergey A. Poniaev Grigorii S. Sokolovskii

ISBN: 978-1-5108-6491-7 ISSN: 1742-6588 Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2017) by the Institute of Physics All rights reserved. The material featured in this book is subject to IOP copyright protection, unless otherwise indicated.

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact the Institute of Physics at the address below.

Institute of Physics Dirac House, Temple Back Bristol BS1 6BE UK

Phone: 44 1 17 929 7481 Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 USA Phone: 845-758-0400 Fax: 845-758-2633 Email: curran@proceedings.com Web: www.proceedings.com

Table of contents

Volume 1038

International Conference PhysicA.SPb/2017

24–26 October 2017, Saint-Petersburg, Russian Federation

Accepted papers received: 22 May 2018 Published online: 18 June 2018

Preface

International Conference PhysicA.SPb/2017

Peer review statement

Papers

Astronomy and Astrophysics

Pulsars with bow shocks: model constraints of the pulsar wind Lorentz factor

A E Petrov, A M Bykov, S M Osipov, A M Krassilchtchikov and K P Levenfish.....1

The optical depth of gamma radiation due to interaction with the thermal bremsstrahlung of hot gas in galaxy clusters.

A N Popov, D P Barsukov and A V Ivanchik.....7

Modeling of the physical selenocentric surface using modern satellite observations and harmonic analysis methods

A O Andreev, N Y Demina, Y A Nefedyev, S A Demin and A A Zagidullin.....12

Analysis of orbital theories for the construction of the numerical theory of the lunar physical librations

A.A. Zagidullin, N.K. Petrova, V.S. Usanin, A.O. Andreev and Y. A. Nefedyev.....18

Heliospheric modulation potential reconstructed by means of the radiocarbon data from the beginning of 11th century AD till the middle of the 19th century AD

A I Kuleshova, V A Dergachev, I V Koudriavtsev, Yu A Nagovitsyn and M G Ogurtsov.....24

Distance Estimate of Tycho's SNR

A V Kozlova and S I Blinnikov.....29

Definitions of energy for the description of gravity as the splitting theory

D. A. Grad, S. A. Paston and A. A. Sheykin.....34

Isotopic terrestrial imprints of solar superflares

D.A. Frolov, V.M. Ostryakov, A.K. Pavlov, A.B. Struminsky and G.I. Vasilyev.....40

Quasistationary fluid motions in magnetized neutron stars

D D Ofengeim, M E Gusakov and E M Kantor.....44

Deep optical observations of the gamma-ray pulsar J2055+2539 with the GTC

D M Beronya, Yu A Shibanov, D A Zyuzin and S V Zharikov.....50

The influence of baryon-photon ratio on 21 and 92 cm brightness temperature

D N Kosenko and A V Ivanchik.....55

Primordial deuterium abundance at $z_{abs} = 2:504$ towards Q1009+2956

E O Zavarygin, J K Webb, S Riemer-Sørensen and V Dumont.....61

On Dynamics and Spectra of Fine Spatial Structures in the Vela Pulsar Wind Nebula

G.A. Ponomaryov, K.P. Levenfish, A.M. Krassilchtchikov, Yu.A. Kropotina and A.E. Petrov.....68

Evolution of anisotropic distributions of weakly charged heavy ions downstream collisionless quasiperpendicular shocks

J A Kropotina, A M Bykov, A M Krassilchtchikov and K P Levenfish.....74

Equation of state of the intergalactic medium in the early Universe

K N Telikova, S A Balashev and P S Shternin.....80

The spatial structure of the Galaxy subsystems as it looks from an analysis of the system of galactic planetary nebulae

Lomara Maksimova and Alexander Kholtygin.....86

Modeling of X-ray images of Tycho's supernova remnant

M E Kalyashova, A M Bykov and S M Osipov.....90

Graviatom of superheavy dark matter as a source of gravitational radiation

M A Misyura and A A Grib.....95

Use of multiparametric analysis of meteor showers for their parental bodies' genetic parameters determination

N Y Demina, A O Andreev, Y A Nefedyev, S A Demin and L A Nefediev.....99

The fractal analysis of the topography and gravitational field of Venus

S A Demin, A O Andreev, N.Y. Demina and Y.A. Nefedyev.....104

Astrometric and photometric baseline observations of the asteroid 2014 JO25

S N Petrova, A V Devyatkin, D L Gorshanov and V N L'vov.....110

Electron and ion acceleration by relativistic shocks: particle-in-cell simulations

V I Romansky, A M Bykov and S M Osipov.....114

Biophysics

Investigation of native cells in liquid using the high aspect ratio nanowhisker probes by means of atomic force microscopy

M V Zhukov, F E Komissarenko, V I Chubinskiy-Nadezhdin and M M Khalisov.....118

Statistical memory effects in human stride dynamics

O.Yu. Panischev, S.N. Panischeva, S.A. Demin and R.R. Latypov.....123

Collective effects in human EEGs at cognitive activity

S.N. Panischeva, O.Yu. Panischev, S.A. Demin and R.R. Latypov.....127

Study of DNA interaction with cobalt disulfophthalocyanine

R Tikhomirov, V Demidov and N Kasyanenko.....130

DNA Damage Induced by Gamma-Radiation Revealed from UV Absorption Spectroscopy

SA Tankovskaia, OM Kotb, OA Dommes and SV Paston.....136

One-channel EEG monitor for tracking the depth of narcosis

V A Simon, V A Gerasimov, D K Kostrin, L M Selivanov and A A Uhov.....142

Super-resolution microscopy of Mollicutes cells

V S Polinovskaya, A D Vedyaykin, I E Vishnyakov, V.A. Ivanov and M A Khodorkovskii.....147

Photoluminescence spectroscopy features in the study of green leaves drying process

V.B. Fadeenko, V.Yu. Rud', Yu.V. Rud', A.P. Glinushkin, V.Ch. Shpunt and William Hogland.....152

Inhibition of Taq polymerase activity by singlet oxygen generation at photodynamic therapy

V.V. Klimenko, N.E. Kaydanov, A.K. Emelyanov, N.A. Verlov, S.V. Shmakov, N.A. Knyazev and A.A. Bogdanov.....157

Devices and materials of the THz and microwave ranges

Features of magnetic field stabilization in caesium atomic clock for satellite navigation system

A A Petrov, N M Grebenikova, N A Lukashev, V V Davydov, N V Ivanova, N S Rodygina and A V Moroz.....164

A Low Phase Noise Tunable Microwave Spin Wave Optoelectronic Oscillator

A B Ustinov, A A Nikitin, V V Lebedev, A A Serebrennikov, A V Shamray, A V Kondrashov and B A Kalinikos.....171

The control of electrophysical properties of GaAs pHEMT heterostructures

G Yakovlev, M Mironova, V Zubkov and A Dudin.....175

Features of use direct and external modulation in fiber optical simulators of a false target for testing radar station

M.Yu. Tarasenko, V.A. Lenets, K.Yu. Malanin, N.V. Akulich and V.V. Davydov.....182

Investigation of the temperature effect on the dynamic parameters of ultrafast silicon carbide current switches

A A Smirnov, S A Shevchenko, B V Ivanov, V A Ilyin and A V Afanasyev.....188

New method for testing of antenna phased array in X frequency range.

V A Lenets, MYu Tarasenko, V V Davydov, N S Rodygina and A V Moroz.....193

Mathematical physics and numerical methods

An inexpensive MP3-Player based 45-kHz band noise generator for engineering and scientific applications

D D Stupin, S V Koniakhin and N A Verlov.....199

The transformation of Hermite-Gauss beams with embedded optical vortex by lens system

E O Monin and A V Ustinov.....203

Stability analysis of the lattice Boltzmann schemes with body force action

Sergey A Mikheev and Gerasim V Krivovichev.....209

Parallel realization of the computational algorithm based on the implicit lattice Boltzmann equations

Elizaveta A Prokhorova and Gerasim V Krivovichev.....215

Estimation of hydrogen permeability parameters by the results of a 'cascade' penetration experiment

Yury V Zaika and Natalia I Rodchenkova.....221

Estimation of localization of point sources from a printed circuit board in the near field

I V Skvortsov, V V Bochkarev and R R Latypov.....227

Nano-structured and thin film materials

Formation of an active part of inertial mass based piezoelectric nanogenerator

A A Semenova, N A Lashkova, A I Maximov and V A Moshnikov.....232

The study of metal-oxide sol-gel nanocomposites using scanning probe microscopy and X-ray photoelectron spectroscopy

A S Lenshin, E V Maraeva, S S Nalimova and A N Beltyukov.....237

Influence of endometallofullerene on the conductive characteristics of polyphenylenoxide

A A Kononov and R A Castro.....242

Gas sensing properties of nanocomposites with ZnO nanowires

A A Bobkov and V I Gorshanov.....247

Investigation of the photoluminescence of porous silicon layers obtained under various technological conditions

A.I. Pastukhov, A.O. Belorus, Yu. M. Spivak and V.A. Moshnikov.....250

Mathematical model of segmented capillary electromigration performances depending on stationary phase physicochemical properties

A Yu Shmykov, V A Kornienko, A N Krasovskii, S V Mjakin, N A Bubis, L Sh Boridko, L M Kuznetzov, A A Fedorov and V E Kurochkin.....254

Synthesis of ternary chalcogenide colloidal nanocrystals in aqueous medium

D S Mazing, I S Chernaguzov, A I Shulga, O A Korepanov, O A Aleksandrova and V A Moshnikov.....260

Thermal effect in magnetic capillary columns

A Y Shmykov, A L Bulyanitsa and N A Esikova.....264

The analyses of the parameters of microporous structure in metal-oxide nanomaterials by comparative sorption methods

E V Maraeva, V A Moshnikov and P V Groshev.....269

Epitaxial GaN nanotripods: morphology and crystal structure

G.A. Sapunov, A.D. Bolshakov, V.V. Fedorov, A.M. Mozharov, D.A. Kirilenko, A.A. Sitnikova and I.S. Mukhin.....274

Formation of fractal microstructures in conductive layers of indium-tin oxides and zinc oxide

A A Bobkov, V F Borodzulya, A V Solomonov, I I Mikhailov, V A Moshnikov, S A Tarasov, I A Lamkin and T D Lebedeva.....278

Study of the electric field strength in planar multigraphene/SiC field emission nanostructures with different arrangement of the electrode planes

I L Jityaev and A M Svetlichnyi.....283

Study of Strained Superlattices Grown by MOCVD Method

I V Fedorov, R V Levin, L A Sokura and L V Danilov.....288

Investigation of photoinduced nucleation and growth of silver nanoparticles

M Churo and L Matyushkin.....292

X-Ray analysis of compacted and sintered UHMWPE reactor powders

M Dermeneva, E Ivan'kova, V Marikhin, L Myasnikova, M Yagovkina and E Radovanova.....297

<u>3D model of short-range order of one-hour milled cellulose</u>

M V Smirnov and S V Loginova.....303

Electrical properties of copper iodide nanoparticles embedded into porous alumina matrix

N O Alexeeva, S E Gango, N I Puchkov, V G Solovyev and A V Cvetkov.....307

Kinetic limitations of stress relaxation and generation in GaN/AlN and AlGaN: Si/AlN heterostructures grown on c-sapphire by plasma-assisted molecular beam epitaxy

O A Koshelev, D V Nechaev, S I Troshkov, V V Ratnikov, V N Jmerik and S V Ivanov.....311

The influence of activation and growth time on the geometry and structural perfection of multi-walled carbon nanotubes

O I Il'in, M V Il'ina, N N Rudyk, A A Fedotov, D I Levshov and O A Ageev.....317

<u>MBE growth of thin AlGaAs nanowires with a complex structure on strongly</u> <u>mismatched SiC/Si(111) substrate</u>

R R Reznik, I V Shtrom, I P Soshnikov, S A Kukushkin, D A Zeze and G E Cirlin.....322

The characterisation of nanostructured porous silicon/silver layers via Raman spectroscopy

R S Smerdov, Yu M Spivak, V S Levitsky and V A Moshnikov.....327

<u>Choice of technological conditions for synthesis of sensing materials based on polyacrylonitrile on flexible substrates</u>

T.V. Semenistaya and A.V. Ivanenko.....331

<u>Magnetostriction in $Fe_{80-x}Co_xP_{14}B_6$ amorphous ribbons evaluated by Becker-Kersten</u> method

V S Severikov, A M Grishin and V S Ignakhin.....336

Nuclear and elementary particle physics

Experimental research of π^0 meson production in U+U collision at 192 GeV

A. Ya. Berdnikov, Ya. A. Berdnikov, D. O. Kotov, P. V. Radzevich and S. V. Zharko.....341

Nuclear modification factors of light mesons in Cu+Au collisions

A. Berdnikov, Ya. Berdnikov, D. Kotov, P. Radzevich and S. Zharko.....345

Optics and Spectroscopy

Optimization of the methods for measuring color characteristics of light-emitting diodes in laboratory conditions

A A Pavlova, A N Ramazanov, V A Simon, D K Kostrin and A A Uhov.....350

Comparative study of impact of random environment on individual and combined Laguerre-Gauss modes

A A Artyukova, M S Kirilenko and S N Khonina.....355

<u>Propagation of the phase-modulated femtosecond pulses through the optically-dense</u> <u>quasi-resonant medium</u>

A A Preobrazhenskaia, A A Pastor, P Yu Serdobintsev, I A Chekhonin and V S Egorov.....361

Holographic formation of phase diffractive elements for light beams conversion with photo-induced absorption coefficient changing in PDLCs

A O Semkin and S N Sharangovich.....368

Xenon clusters fragmentation in a supersonic beam under ionization by electrons and photons

A N Arseniev, P Yu Serdobintsev, A S Melnikov, L P Rakcheeva, A A Pastor and M A Khodorkovskii.....377

Waveguide and Γ -factor optimization for low-divergence ridge lasers

I K Boikov, A V Savelyev and A E Zhukov.....383

The generation of evanescent beams by means of binary diffraction axicons with high numerical aperture

D A Savelyev.....390

Double magnetic resonance in the hyperfine structure of optically oriented alkali atoms with laser pumping

A A Baranov, S V Ermak, E A Sagitov and V V Semenov.....395

Inscription and visualization of tilted fiber Bragg gratings

E.A. Frolov, K.A. Konnov, A.I. Gribaev, V.V. Zakharov, A.A. Mikhneva, V.A. Novikova and S.V. Varzhel.....403

Simulation of light focusing by two-layer microcylinder

E S Kozlova.....408

Comparative spectral analysis of the extra-cell matrixes surface of heart valves before and during the process of their decullularization

E V Timchenko, P E Timchenko, L T Volova, D A Dolgushkin, P Y Shalkovskaya and D S Trapeznikov.....413

Effect of Ga⁺ focused ion beam etching on photoluminescence of AlGaAs/GaAs heterostructure.

G V Voznyuk, I V Levitskii, M I Mitrofanov, D N Nikolaev and V P Evtikhiev.....419

Multichannel IR Fourier transform spectrometer

I Sh Khasanov, V A Vagin and II S Golyak.....424

Investigation of multimodality effect in quantum dots InGaAs/GaAs grown by MOVPE

I S Kosarev, A M Nadtochiy, R A Salii and N A Kalyuzhnyy.....430

Self-focusing of the light in transparent nanosuspension

K V Platonov, V I Ivanov and A V Myagotin.....436

The synovial fluid analysis by using Raman Scattering spectroscopy in order to educe the synovial joint pathology

E Timchenko, P Timchenko, L Volova, D Dolgushkin, M Markova and E Yagofarova.....441

Simulation of the propagation of the vortex eigenfunctions of the two-lens system in the parabolic fiber

M S Kirilenko.....445

Theoretical calculations of resonant signals in the atomic-beam quantum frequency standard with laser pumping and detection

A Yu Rumyantsev and M V Petrenko.....450

Diagnostic of semiconductor device structures by spin-labeled electrons

R.I. Dzhioev, M. Kotur and N.K. Poletaev.....456

On the possibility of recording absorption spectra in weak magnetic fields by the method of nuclear magnetic resonance

N S Myazin, V V Davydov, V V Yushkova and V Yu Rud'.....461

The universal optical method for condition control of flowing medium

N M Grebenikova, K J Smirnov, V V Artemiev, V V Davydov and S V Kruzhalov.....467

Raman spectroscopy method for the evaluation of bone bioimplants made using the "Lyoplast" technology from cadaveric and in vivo resected bone tissue

P E Timchenko, E V Timchenko, L T Volova, D A Dolgushkin, V V Boltovskaya and O O Frolov.....475

Thermal lens spectroscopy in two-component liquid

O O Ovseychook, V I Ivanov and G D Ivanova.....482

Diffraction on random fractal structures

O A Mossoulina and S G Volotovsky.....487

New method of researches of the magnetic fields force lines structure

S E Logunov, V V Davydov, M G Vysoczky and M S Mazing.....493

Model of ultra-wideband signal transmission and reception using the pseudorandom carrier

S V Valin, V A Glukhov, A V Siasko and Yu A Tolmachev.....501

Phase-shifted fiber Bragg gratings fabrication method

V.A. Novikova, S.V. Varzhel, K.A. Konnov, A.I. Gribaev, A.A. Mikhneva and E.A. Frolov.....506

Optical method for assessing the effectiveness of treatment of staphylococcal infection of tonsils

P E Timchenko, E V Timchenko, A A Asadova and Yu D Ityaksov.....512

Optoelectronic devices

Carrier lifetime in InAs(Ga,Sb,P) heterostructures

A A Semakova, N L Bazhenov and K D Mynbaev.....519

Modification of the CCD photodetectors for the suppression of interference in their internal structure

A N Ramazanov, V A Simon, A A Uhov, D K Kostrin, V A Gerasimov and L M Selivanov.....523

<u>Eigen-frequencies of whispering gallery modes of disk dielectric resonators: a dimensional quantization method</u>

G.A. Zaretskaya, A. V. Drozdovskii, A. B. Ustinov and B. A. Kalinikos.....529

Photosensitivity of structures based on A^{II}B^{III} ₂C^{VI} ₄ monocrystals

I.A. Zharikov, V.Yu. Rud ', Yu.V. Rud ', E.I. Terukov, V.V. Davydov and N.N. Bykova.....534

Drift-diffusion numerical simulation of UTC photodiodes for on-chip optical interconnections

I V Pisarenko and E A Ryndin.....540

Photocathodes for near infrared range devices based on InP/InGaAs heterostructures

K J Smirnov, V V Davydov, S F Glagolev, N S Rodygina and N V Ivanova.....546

Creation and investigation of OLED-structures with inclusion of colloidal quantum dots

Eremeev Mark Anatolyevich, I.I. Mikhailov, S.A. Tarasov, I.A. Lamkin, P.O. Tadtaev and A.E. Degterev....551

Organic photodetective device based on metal phthalocyanine

M D Pavlova, I A Lamkin, S A Tarasov and A V Solomonov.....557

Series spreading resistance in single- and multi-junction concentrator solar cells

M A Mintairov, V V Evstropov, S A Mintairov, M Z Shvarts and N A Kalyuzhnyy.....561

A Theoretical Model of Dual Tunable Optoelectronic Oscillator

V.V. Vitko, A.A. Nikitin, A.B. Ustinov and B.A. Kalinikos.....566

Physics and technology of energy conversion

Development of the technology of manufacturing connecting elements in cascade photodetectors

A E Marichev, R V Levin, N D Prasolov, E V Kontrosh and B V Pushnyi.....572

<u>Optical emission spectroscopy of gallium phosphide plasma-enhanced atomic layer</u> <u>deposition</u>

A V Uvarov and A S Gudovskikh.....576

Sensitivity and directivity measurement of ultrasonic transducer with polymer-powder matching layer

Marsel Fazlyyyakhmatov.....581

The investigation of InGaAs quantum dot growth peculiarities for GaAs intermediate band solar cells

R A Salii, S A Mintairov, M A Mintairov, A M Nadtochiy, M Z Shvarts and N A Kalyuzhnyy.....589

The thermovoltaic effect in rare-earth semiconductors based on *SmS* and the conversion of thermal energy into electrical energy on its basis

M A Grevtsev, G D Havrov, S A Kazakov and V V Kaminskii.....595

Photon-coupled characteristic of a multijunction solar cell

S A Levina, E D Filimonov and M Z Shvarts.....600

Control of ferroelectrics polarization for increasing of alternative energy device's efficiency coefficient

V I Zubtsov, E V Zubtsova and V V Senterova.....605

Thermoelectric element on the basis of the sandwich metal-ferroelectric-metal structure

Yu O Perkov and V I Ivanov.....612

Physics of ferroics

Investigation of the electrocaloric effect in strontium barium niobate (SBN) ceramics with rare-earth dopants

A V Es'kov, A S Anokhin, M T Bui, O V Pakhomov, A A Semenov, P Yu Belyavskiy and A B Ustinov.....617

Features of spin-wave envelope solitons of the terahertz frequency range in thin hexaferrite films

M A Cherkasskii, A V Drozdovskii and A V Es'kov.....622

Polarization switching in single crystals and films of 2-methylbenzimidazole

F B Svinarev, E V Balashova, G A Pankova and B B Krichevtsov.....626

Investigation of conductivity mechanisms in ferroelectics based on the doped barium titanite

I L Mylnikov, A I Dedyk, Yu V Pavlova, A P Burovihin, P Yu Belyavskiy, A A Semenov and O V Pakhomov.....634

Physics of quantum structures

Resonant Bragg structures with GaN/AlGaN Quantum Wells

D S Arteev, A V Sakharov, W V Lundin, E E Zavarin, S O Usov, V V Chaldyshev, A S Bolshakov, M A Yagovkina and A F Tsatsulnikov.....639

Single photon emitters based on hybrid microcavities with InAs/Al_xGa_{1-x}As quantum dots

K G Belyaev, M V Rakhlin, G V Klimko, U M Zadiranov, M M Kulagina, I V Sedova, S V Ivanov and A A Toropov.....645

Estimation of the area of field emission of a carbon nanotube using modelling in COMSOL Multiphysics

M A Chumak, S V Filippov, A G Kolosko and E O Popov.....649

Intraband light absorption by holes in InGaAsP/InP quantum wells

N V Pavlov and G G Zegrya.....655

Interplay between angular and quantum magnetoresistance oscillations

P.D. Grigoriev and T.I. Mogilyuk.....660

Investigation of GaAs/AlGaAs superlattice by photoreflectance method

V D Goryacheva, M S Mironova and O S Komkov.....666

Plasma physics, hydrodynamics and aerodynamics

Effect of the toroidal magnetic field the on energy and fast particle confinement in the Globus-M spherical tokamak

A Yu Telnova, V K Gusev, N N Bakharev, G S Kurskiev, M I Patrov, Yu V Petrov, E O Kiselev, V B Minaev, N V Sakharov and P B Shchegolev.....672

Role of resonance radiation trapping in the mechanisms of constriction of the glow discharge. Theory and experiment.

Yu B Golubovskii, A V Siasko, D V Kalanov and V O Nekuchaev.....676

The external circuit effect on the steady states of a vacuum diode with a decelerating electron beam

V.I. Kuznetsov and A.B. Gerasimenko.....682

Numerical Investigation of Cavitating Flows with Liquid Degassing

U Iben, A Makhnov and A Schmidt.....687

Modification of the surface layers with plasma of a vacuum-arc discharge by controlling the energy of precipitating particles

A A Rikov, M I Yurchenkov, M I Pikus, D K Kostrin and A A Lisenkov.....693

Comparative analysis of transition models in prediction of flow over NACA-0012 airfoils in tandem

A A Matyushenko, A S Stabnikov and A V Garbaruk.....697

Erosion of rod electrodes of the air AC plasma torch

D I Subbotin, A V Surov, V.E. Kuznetsov, V.E. Popov, J D Dudnik, J D Kuchina and N V Obraztsov.....703

Unsteady processes in a natural convective plume

E F Khrapunov and Y S Chumakov.....710

Some aspects of numerical modeling of inviscid supersonic flow in a duct with a central wedge

E V Kolesnik and E M Smirnov.....716

Assessment of two approaches to accelerate RANS to LES transition in shear layers in the framework of ANSYS-FLUENT

E K Guseva, M S Gritskevich and A V Garbaruk.....722

Numerical simulation of aeroacoustical noise from a wing-flap configuration

K. Nikiforova and A. Garbaruk.....728

Large Eddy Simulation of airflow in a test ventilated room

N G Ivanov and M A Zasimova.....734

Modelling of heating of plasma-chemical reactor in Comsol Multiphysics.

N V Obraztsov, D I Subbotin, V E Popov, V Y Frolov and A V Surov.....740

Numerical investigation of swirling flow in the graft with a spiral ridge

Y F Radchenko, Y A Gataulin, A D Yukhnev, V N Vavilov and A A Moiseev.....747

Surface phenomena

Phase-structural irregularity of the mechanically activated saponite-containing material surface

M V Morozova, M A Frolova, T A Makhova and V S Lesovik.....753

Protolytic properties influence of the dispersion medium on the process of silicic acid polycondensation

V E Danilov and A M Ayzenshtadt.....759

Surface tension determination in glyoxal-silica dispersed system

Y V Sokolova, A M Ayzenshtadt, V V Strokova and V S Malkov.....764