International Interdisciplinary Conference "Euler Readings MRSU 2017"

Journal of Physics: Conference Series Volume 996

Moscow, Russia 22 – 24 November 2017

ISBN: 978-1-5108-6125-1

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 996

International Interdisciplinary Conference "Euler Readings MRSU 2017"

22–24 November 2017, Moscow Region State University (MRSU), Russian Federation

Accepted papers received: 19 March 2018

Published online: 4 April 2018

Preface

International Interdisciplinary Conference "Euler Readings MRSU 2017"

Peer review statement

Papers

Introductory Paper

Development of Euler's ideas at the Moscow State Regional University

P I Vysikaylo and V V Belyaev.....1

Mathematics and Mathematical Physics

Geometric situation of points of division of regions of direct and return currency in channels with the presence of heating zone limited on the longitudinal coordinate

A Gerasimov, A Kirpichnikov and F Sabirova.....7

Mathematical modeling of the MHD stability dependence on the interpole distance in the multianode aluminium electrolyser

R N Kuzmin, N P Savenkova, A V Shobukhov and A V Kalmykov.....13

Mathematical modeling of the toroidal vortex structures interacti	Mathematics	d modeling	of the	toroidal	vortex structures	interaction
---	--------------------	------------	--------	----------	-------------------	-------------

S A Skladchikov, N P Savenkova and R N Kuzmin....18

The stability issues in problems of mathematical modeling

A. Yu. Mokin, N. P. Savenkova and N. S. Udovichenko....23

Analytical properties of nonequilibrium threshold in shock waves

M M Kuznetsov, Y D Kuleshova, Yu G Reshetnikova and L V Smotrova.....29

The H-theorem and equation of state for kinetic model of imperfect gas

A. M. Bishaev, V. A. Rikov and M. V. Abgaryan....32

On interaction of P-waves with one-dimensional photonic crystal consisting of weak conducting matter and transparent dielectric layers

A A Yushkanov and N V Zverev.....37

On behavior peculiarity of electron plasma

N M Gordeeva and A A Yushkanov.....41

The estimation of the internal dimensions of the channel for transport of atoms, molecules from the variation principles and the conditions of its local symmetry

N A Krylova and E V Kalashnikov.....45

Physics and Material Science

Sources and components of ball lightning theory

A I Nikitin, V L Bychkov, T F Nikitina, A M Velichko and V I Abakumov.....50

On modeling of "plasmoid" created by electric discharge

V L Bychkov, S V Anpilov, N P Savenkova, V Stelmashuk and P Hoffer.....70

On electro-hydrodynamic effects over liquids under influence of corona discharge

V L Bychkov, V I Abakumov, A R Bikmukhametova, V A Chernikov and D A Safronenkov.....77

On the physics of electron transfer (drift) in the substance: about the reason of "abnormal" fast transfer of electrons in the plasma of tokamak and at known Bohm's diffusion

I A Boriev.....86

Solar wind as a consequence of Coulomb mirror effect in astrophysics

P I Vysikaylo and M A Korotkova.....92

Model of superconductivity formation on ideal crystal lattice defect—twin or twin boundary (MSC-TB)

V A Chizhov, F S Zaitsev and V L Bychkov.....101

Existence of dark matter with observed properties of cosmic microwave background radiation substantiates three conservation laws of classical physics and all principles of quantum mechanics as creates the value of Planck's constant

I A Boriev....106

Theory of liquid crystal orientation under action of light wave field and aligning surfaces

A K Dadivanyan, D N Chausov, V V Belyaev, N N Barabanova, O V Chausova and Yu D Kuleshova.....113

Interaction of dyes CD-1 and SD-1 with the surface of oligodimethysiloxane

D N Chausov.....117

Variational Approach in the Theory of Liquid-Crystal State

E V Gevorkyan....122

Practical Application and Economics

Controllable light beam shaper in LED lamp

K D Nessemon, I V Popov, V V Belyaev, A A Belyaev and V K Velichko.....125

<u>Eulerian Circles (Venn Diagrams) as model for modern economy education on the basis of Russian professional standards</u>

M A Sharonov, O V Sharonova and V P Sharonova.....130