

Volume 1 • Number 1 • 2014

ISSN 2312-4334

---

# **East European Journal of Physics**

---



**Karazin Kharkiv National University Publishing**

ISSN 2312-4334

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

# **East European Journal of Physics**

**Volume 1 · Number 1**

2014

# East European Journal of Physics

---

EEJP is an international peer-reviewed journal devoted to experimental and theoretical research on the nuclear physics, cosmic rays and particles, high-energy physics, solid state physics, plasma physics, physics of charged particle beams, plasma electronics, radiation materials science, physics of thin films, condensed matter physics, functional materials and coatings, medical physics and physical technologies in an interdisciplinary context.

Published quarterly in hard copy and online by Karazin Kharkiv national University Publishing.

The editorial policy is to maintain the quality of published papers at the highest level by strict peer review.

Approved for publication by the Academic Council of the Karazin Kharkiv National University (February 28, 2013, protocol No.3)

## Editor-in-Chief

Azarenkov N.A. Karazin Kharkiv National University, Kharkiv, Ukraine

## Deputy editor

Girka I.A. Karazin Kharkiv National University, Kharkiv, Ukraine

## Editorial Board

Adamenko I.N., Karazin Kharkiv National University, Ukraine

Akulov V.P., City University of New York, USA

Antonov A.N., Institute of Nuclear Research and Nuclear Energy, Sofia, Bulgaria

Barannik E.A., Karazin Kharkiv National University, Ukraine

Beresnev V.M., Karazin Kharkiv National University, Ukraine

Berezhnoy Yu.A., Karazin Kharkiv National University, Ukraine

Bizyukov A.A., Karazin Kharkiv National University, Ukraine

Broda B., University of Lodz, Poland

Budagov Yu.A., Joint Institute of Nuclear Research, Dubna, Russia

Dragovich B.G., University of Belgrade, Serbia

Duplij S.A., Karazin Kharkiv National University, Ukraine

Garkusha I.E., NSC Kharkiv Institute of Physics and Technology, Ukraine

Gofman Yu., Jerusalem College of Technology, Israel

Grekov D.L., NSC Kharkiv Institute of Physics and Technology, Ukraine

Khodusov V.D., Karazin Kharkiv National University, Ukraine

Kondratenko A.N., Karazin Kharkiv National University, Ukraine

Korchin A.Yu., NSC Kharkiv Institute of Physics and Technology, Ukraine

Krivoruchenko M.I., Institute for Theoretical and Experimental Physics, Moscow, Russia

Lavrinenko S.D., NSC Kharkiv Institute of Physics and Technology, Ukraine

Lazurik V.T., Karazin Kharkiv National University, Ukraine

Mel'nik V.N., Institute of Radio Astronomy, Kharkiv, Ukraine

Merenkov N.P., NSC Kharkiv Institute of Physics and Technology, Ukraine

Noterdaeme J.-M., Max Planck Institute for Plasma Physics, Garching, Germany

Nurmagambetov A.Yu., NSC Kharkiv Institute of Physics and Technology, Ukraine

Ostrikov K.N., Plasma Nanoscience Centre Australia, Clayton, Australia

Peletminsky S.V., NSC Kharkiv Institute of Physics and Technology, Ukraine

Pilipenko N.N., NSC Kharkiv Institute of Physics and Technology, Ukraine

Radinschi I., Gheorghe Asachi Technical University, Iasi, Romania

Slyusarenko Yu.V., NSC Kharkiv Institute of Physics and Technology, Ukraine

Smolyakov A.I., University of Saskatchewan, Saskatoon, Canada

Shul'ga N.F., NSC Kharkiv Institute of Physics and Technology, Ukraine

Tkachenko V.I., NSC Kharkiv Institute of Physics and Technology, Ukraine

## Technical Editor

Girnyk S.A.

## Editorial office

Department of Physics and Technologies

Karazin Kharkiv National University

Kurchatov av., 31, office 402, Kharkiv, 61108

Ukraine

**Tel:** +38-057-335-18-33

**E-mail:** [eejp@univer.kharkov.ua](mailto:eejp@univer.kharkov.ua)

**Web-page:** <http://eejp.univer.kharkov.ua>

Certificate of State registration No.20644-10464P, 21.02.2014

# East European Journal of Physics

Volume 1

Number 1

2014

---

## REVIEWS

- Structure properties of neutron-rich exotic nuclei** 4  
A.N. Antonov, M.K. Gaidarov, P. Sarriguren, E. Moya de Guerra

## ORIGINAL PAPERS

- Energetic characteristics of the surface electromagnetic wave at plasma-plasma interface in magnetic field** 21  
S.V. Ivko, I.B. Denysenko, N.A. Azarenkov
- Comparative kinetics of ions for different modes of parametric instability of intense Langmuir waves in plasma** 30  
A.V. Kirichok, V.M. Kuklin, A.V. Pryjmak
- Electrotransport as a way of metals deep purification** 37  
G.P. Kovtun
- Effect of irradiation on properties of CdTe detectors** 47  
A.I. Kondrik
- Influence of the relativistic electron beam spectral characteristics on the instability development process at near-limiting currents** 53  
G.E. Sarukhanian, A.M. Gorban'
- Plasma filters in technique of the vacuum-arc composite coating deposition** 57  
D.S. Aksyonov, I.I. Aksenov, V.A. Belous, Yu.A. Besedina, S.I. Mel'nikov
- Electron beam transport in dielectric tubes** 70  
O.S. Druj, V.V. Yegorenkov, A.V. Shchagin, V.B. Yuferov
- The features of multiscaling and hierarchy of structures in zirconium alloys** 74  
V.G. Kirichenko
- Enhanced surface diffusion of particles under the action of an external time-periodic fields** 80  
I.G. Marchenko, I.I. Marchenko
- Neutron-absorbing method for concentrations Measuring of a boron-10 isotope in water solution of boric acid and water solution of boric acid** 87  
A.N. Orobinskiy
- Defining the role of radiation risk factor in cancer causation among KIPT workers: prognosis of stochastic effects and forming of risk groups** 95  
A. Mazilov, I. Stadnyk