



JOINT COMPANY
«RESEARCH AND PRODUCTION CORPORATION
«SPACE MONITORING SYSTEMS, INFORMATION & CONTROL AND
ELECTROMECHANICAL COMPLEXES» NAMED AFTER A.G. IOSIFIAN»
(JC «VNIIEM CORPORATION»)

ELECTROMECHANICAL MATTERS. VNIIEM STUDIES

Scientific and technical journal
Published since 1959
Released once every two months

ISSN 2500-1299

Tome 188

№3
2022

Chief Editor:

MAKRIDENKO L. A., Deputy General Director – General Designer, D. Sc. (Tech.)

Editorial board:

Gecha V. Ia., D. Sc. (Tech.) (Deputy Chief Editor),
Gorbunov A. V., Ph. D. (Tech.),
Gadzhiev E. V., Ph. D. (Tech.),
Duyshenaliyev T. B., D. Sc. of Physics and Mathematics (Kyrgyz Republic),
Zakharenko A. B., D. Sc. (Tech.),
Zolotov S. A., Ph. D. (Tech.) (Republic of Belarus),
Iskhakov A. S., Ph. D. (Tech.),
Kazantsev S. G., D. Sc. (Tech.),
Karachun N. D., D. Sc. (Tech.),
Kobelkov N. O., D. Sc. of Military Science, Ph. D. (Tech.),
Minaev I. V., D. Sc. (Tech.),
Nurguzhin M. R., D. Sc. (Tech.) (Republic of Kazakhstan),
Pinchuk A. V., Ph. D. of Military Science, Sarychev A. P., D. Sc. (Tech.),
Sidnyaev N. I., D. Sc. (Tech.),
Tyutnev A. P., D. Sc. of Physics and Mathematics, Ph. D. of Chemical Sciences
Fedotov A. Yu., D. Sc. (Tech.),
Chunikhina O. A.
(Editorial board Executive secretary)

Executive editor:

Gecha V. Ia., D. Sc. (Tech.)

Subscription index:

Union catalogue
«Pressa Rossii»
87648

Editorial office address:
JC «VNIIEM Corporation», 30 Volnaia st., Moscow, Russian Federation. Postcode: 105187.
Tel.: (495) 365-30-63.
E-mail: vniem@vniem.ru; redactori@mcc.vniem.ru.
http://jurnal.vniem.ru.

Signed for print 28.06.2022. Format: 60×84 1/8.
Conventional printed sheet 5,12. Circulation: 150 copies.

Printed at «SAM-POLIGRAFIST» LLC6,
Protopopovskii pereulok, Moscow. Tel.: (495) 545-37-10.
www.onebook.ru.

The journal is registered by the Federal Service for Supervision of Communications, Information Technology and Mass Media, Registration Certificate ПИ № 77-74183 dated 30.11.2018.

The journal is recommended by the Ministry of education and science of Russia for publication of scientific works reflecting the main scientific content of candidate and doctoral dissertations.

Full or partial use of the information published in the journal is allowed only after coordination with the editorial department, with indication of the source.

© JC «VNIIEM Corporation», 2022

CONTENTS

GENERAL QUESTIONS OF ELECTROMECHANICS

D. A. Vyrykhanov

Determination of optimal switch-on time of a linear electric motor when it is powered from a capacitor-type energy storage device 3

SPACE ELECTROMECHANICS. SPACE CRAFTS. NEAR-EARTH SPACE RESEARCH

A. I. Gruzdev, D. Yu. Nosov, S. V. Pushko

Approaches to construction of structurally unified standard series of storage batteries for low-voltage and high-voltage power supply systems of spacecraft 8

M. I. Ashryapov

Radar recognition of doppler signals by wavelet correlation analysis 18

S. V. Litvinov

Development of a simulation program for an ionospheric support system for an oth-radar 25

V. S. Losev, B. A. Starostenko,

V. A. Tsvetkov, S. G. Kondratyeva

Use of phase and amplitude-phase synthesis for suppression of the first side lobe of the antenna array 31

ELECTROMECHANICS AND THE SOCIO-ECONOMIC DEVELOPMENT OF THE NATION

I. N. Khiblin, L. A. Amelin,

A. V. Karelina, V. V. Onufriyev

About gamma-ray radiation source in nuclear-optical converters 36