

CONTENTS

VOLUME 57

NUMBER 1

2002

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Theoretical and Mathematical Physics

- Asymptotic representation of electromagnetic field of a waveguide in the neighborhood of a boundary edge. A.N. Bogolyubov, A.L. Delitsyn, I.E. Mogilevskii, and A.G. Sveshnikov 3 1
- Heat capacity of γ -phase solid oxygen. P.N. Nikolaev 14 7
- Explicit solutions for completely integrable classical Calogero–Moser systems in an external field. D.V. Meshcheryakov and T.D. Meshcheryakova 18 12

Atomic and Nuclear Physics

- The role of $(\gamma, 2n)$ reaction channel in forming light stable isotopes on irradiation of ^{204}Pb nucleus with intense γ -quanta beams. B.S. Ishkhanov and S.I. Pavlov 21 16

Optics and Spectroscopy

- On energy balance in light reflection. S.G. Ilyina 27 21
- Spectrophotometric method for determining order parameter of liquid-crystal polymers in an electrooptical cell. D.F. Kiselev, T.M. Glushkova, S.A. Ivanov, M.M. Firsova, and A.P. Shtyrkova 30 25
- Three-parametric model of formation of photosynthesizing organisms fluorescence response under laser pulse excitation. D.V. Maslov, V.V. Fadeev, and P.N. Litvinov 34 30

Solid-State Physics

- Physicochemical processes going on in biotite under heat treatment. U. Abdurakhmanov, A.B. Granovsky, A.A. Radkovskaya, M.Kh. Usmanov, Sh.M. Sharipov, and V.P. Yugai 38 36
- Measurements of magnetic parameters of ferromagnetic films. L.I. Antonov, L.M. Korenkova, T.N. Letova, I.M. Saraeva, and D.G. Skachkov 41 41
- Influence of charged surface electronic states on the structure of thin Langmuir–Blodgett films on semiconductor surface. V.V. Belyaev, V.B. Zaitsev, T.V. Panova, G.S. Plotnikov, and M.L. Zanaevskii 44 46
- Noncommutative thermomechanical deformation. Trinh Van Khoa 49 52
- Peculiarities of static displacements around solitary impurity atoms in the HCP lattice. V.M. Silonov, A.Yu. Geniev, and I.V. Kharlamova 52 57

Geophysics

- Seasonal dependence of thermal neutrons anisotropy near the Earth's surface. B.M. Kuzhevskij, O.Yu. Nechaev, and E.A. Sigaeva 55 61

Brief Communications

Theoretical and Mathematical Physics

Light rays bending by centrally symmetric gravitational field in scalar-tensor gravitation theory. V.I. Denisov and H.H. Hernandez	59	66
Response behavior of embedded eigenvalues under changes of waveguide filling. M.D. Malykh	61	69

Acoustics and Molecular Physics

Convective, thermal, and acoustic instability of nonequilibrium gas plane layer. A.V. Uvarov, A.I. Osipov, and D.B. Rubinskii	62	72
---	----	----

CONTENTS

VOLUME 57

NUMBER 2

2002

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Theoretical and Mathematical Physics

Resonance fragmentation of organic molecules on a surface. V.V. Komarov, A.M. Popova, I.O. Stureiko, and H. Jungclas	6	1
Photon-graviton conversion in the Kaluza-Klein model. M.S. Pshirkov and M.V. Sazhin..	9	6
Heating of steel cylindrical samples in bounded solenoids. R.V. Budnik and V.B. Glasko..	12	10

Atomic and Nuclear Physics

First experimental studies of ion-atom collisions at the Research Institute of Nuclear Physics, Moscow State University. A.Ya. Teplova	16	16
Effect of charge exchange of ^{14}N and ^{16}O ions with 30–330 keV/nucleon energies on their multiple scattering in metal films. A.A. Bednyakov and V.S. Nikolaev	17	18
Interaction of fast multiply charged ions with solid and gaseous media. Ya.A. Teplova, I.S. Dmitriev, and Yu.A. Belkova	23	26
Average charge of multiply charged ions passing through matter under nonequilibrium conditions. V.V. Balashov, A.V. Bibikov, and I.V. Bodrenko	28	34
Effect of the final-state particle interaction on the cross section for the single ionization of the helium atom by multiply charged ions. N.V. Novikov and V.S. Senashenko ...	33	41

Radiophysics

Loss-dependent mode selection in a cyclotron-autoresonance maser with an open interference waveguide. A.F. Aleksandrov and V.A. Kubarev	36	46
---	----	----

Optics and Spectroscopy

Study of the structure of micelle-polyelectrolyte complexes by the Rayleigh scattering technique. D.B. Alekseev, N.N. Ruleva, and A.M. Saletskii	40	51
Numerical modeling of light scattering by aggregating erythrocyte suspensions. O.E. Fedorova and A.V. Priezhev	43	55
Polarization dynamics of Yb-doped double-clad fiber laser radiation. V.G. Voronin, O.E. Nanii, A.N. Turkin, A.S. Kurkov, S.E. Vasil'ev, O.I. Lobadetskii, D.A. Gubankov, and M.N. Nikolaev	46	60

Acoustics and Molecular Physics

Development of an acoustic jet near the waveguide open end. I.V. Lebedeva and A.E. Grushin	49	64
--	----	----

Solid-State Physics

The structure of ultrathin linear-chain carbon films. N.D. Novikov, V.G. Babaev, M.B. Guseva, V.V. Khvostov, and D.N. Novikov	57	68
---	----	----

Geophysics

Mathematical modeling of the spring thermal bar in a shallow water basin. N.S. Blokhina, A.V. Ovchinnikova, and A.E. Ordanovich	60	73
--	----	----

Brief Communications

Theoretical and Mathematical Physics

Nonlinear spin oscillations in systems with inhomogeneous exchange interaction. L.V. Zhukovskaya, A.M. Savchenko, and B.I. Sadovnikov	71	80
A possibility of cathodoluminescence microtomography. K.Yu. Dorofeev, E.I. Rau, R.A. Sennov, and A.G. Yagola	73	83

CONTENTS

VOLUME 57

NUMBER 3

2002

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Theoretical and Mathematical Physics

Statistical ensemble and passage from quantized thermodynamics to classics. V.P. Maslov	3	1
Two-soliton solutions of sin-Gordon equation and related pseudospherical surfaces. E.V. Maevskii	10	12
The behavior of embedded eigenvalues of the Helmholtz equation under small perturbations. M.D. Malykh	13	17
A problem of semiconductor physics with mixed boundary condition specified on a periodic system of electrodes lying along a line. K.V. Prozorov and P.A. Krutitskii	16	22
Vortex-ring-like and potential solutions in n dimensions. A.D. Popova	20	28
Interaction of polyatomic molecules at low energies. V.V. Komarov, A.M. Popova, I.O. Stureiko, and H. Jungclas	24	35
Effect of various-scale roughness on reflectivity from interface boundary. A.N. Bogolyubov and A.A. Tikhonravov	27	40
Estimation of specimen parameters in scanning electron microscope on the basis of quantitative model of beam–solid interaction. S.S. Borisov, E.A. Grachev, D.M. Ustinin, E.A. Cheremukhin, and A.I. Chulichkov	32	48
Boundary-value problem for the Helmholtz equation in a multiply connected waveguide region with piecewise constant boundary. Yu.Yu. Kryukova and V.P. Modenov	36	53
Analogs of instanton solutions in theories regularized by higher covariant derivatives. E.V. Bagdasarova and K.V. Stepanyants	41	60

Atomic and Nuclear Physics

Reconstruction of photonuclear process cross-sections in studies with bremsstrahlung gamma beams. V.K. Grishin, B.S. Ishkhanov, and G.S. Nefedov	44	65
--	----	----

Optics and Spectroscopy

Difference in polarizabilities as a characteristic of Raman-active properties of a molecule. S.Yu. Nikitin	50	69
--	----	----

Solid-State Physics

Zeeman effect and energy level crossing in strong magnetic field in rare-earth compounds $\text{RBa}_2\text{Cu}_3\text{O}_{7-\delta}$, $\text{R} = \text{Dy, Ho, Er, Tm}$. A.A. Demidov, Z.A. Kazei, and N.P. Kolmakova	53	73
Electron paramagnetic resonance of trivalent cerium ions: to the g -factor theory. I.V. Chepeleva	61	79

Brief Communications

Optics and Spectroscopy

Surface plasmons-polaritons and asymmetric speckles. Yu.V. Vasil'ev, A.V. Kozar', E.F. Kuritsyna, and A.E. Luk'yanov	65	84
---	----	----

Solid-State Physics

Effect of illumination on isothermal relaxation of photoinduced metastable states in slightly boron-doped α -Si:H films. I.A. Kurova, N.N. Ormont, and A.L. Gromadin	67	88
Ordering of magnetic moments of atoms in a crystal on application of electric field. A.A. Opalenko and S.K. Godovikov	70	92

CONTENTS

VOLUME 57

NUMBER 4

2002

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Theoretical and Mathematical Physics

Dynamics of parametrically perturbed maps. A.Yu. Loskutov, S.D. Rybalko, and A.K. Prokhorov	3	1
Mathematical modeling of diffraction on domain structures. A.N. Bogolyubov and V.V. Seregin	7	8
Compton emission of axions from highly magnetized degenerate relativistic electron gas. A.V. Borisov and P.E. Sizin	13	13
The two-loop β -function of the $N = 1$ supersymmetric electrodynamics regularized by a loop momentum cutoff. P.I. Pronin, B.A. Rozentul, and K.V. Stepanyants	17	18
Effective potential for the $SU(3) \times U(1)$ gauge field model at finite temperature. V.Ch. Zhukovskii and A.S. Razumovskii	20	23

Atomic and Nuclear Physics

Calculating the fraction of nuclei in fast ion beams of light elements. I.S. Dmitriev	25	30
---	----	----

Radiophysics

Parametric model of expected uncertainty for a gravitational-wave antenna under two-mode operation. M.P. Vinogradov and A.V. Gusev	29	36
--	----	----

Optics and Spectroscopy

Compatible quantum information as applied to the Dicke problem. B.A. Grishanin and D.V. Sych	37	41
--	----	----

Solid-State Physics

Dimensional quantization in GaAs/Al _x Ga _{1-x} As heterostructures according to photo-reflection spectroscopy data. L.P. Avakyants, P.Yu. Bokov, I.P. Kazakov, and A.V. Chervyakov	48	48
Dielectric dispersion in Langmuir–Blodgett films of polyvinylidene fluoride–trifluoroethylene copolymer. A.M. Lotonov	51	53
Self-consistent model of domain structure in KDP-type ferroelectric crystals. A.A. Zhukov and P.A. Prudkovskii	55	58

Brief Communications

Theoretical and Mathematical Physics

Spin dynamics of a neutral particle in electromagnetic field. A.E. Lobanov, O.S. Pavlova, and G.A. Chizhov	60	65
--	----	----

Atomic and Nuclear Physics

70-MeV electron pulsed racetrack microtron. I.V. Gribov, A.N. Ermakov, B.S. Ishkhanov, G.A. Novikov, V.S. Skachkov, N.P. Sobenin, V.P. Trover, V.I. Shvedunov, and I.V. Shvedunov	62	69
---	----	----

Geophysics

Energy of the El Niño phenomenon. G.G. Khundzhua and A.B. Nelepo	63	72
Laboratory simulation of turbulence. Yu.G. Pyrkin, V.P. Petrov, I.N. Ivanova, and M.A. Silaev	65	75

CONTENTS

VOLUME 57

NUMBER 5

2002

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Theoretical and Mathematical Physics

Magnetic field in a swirling semi-bounded jet. O.Yu. Smirnova and D.D. Sokolov	3	1
Ionization by intense laser radiation under the action of quantizing magnetic field. V.N. Rodionov, G.A. Kravtsova, A.M. Mandel'	6	6
Fragmentation of quantum systems with many degrees of freedom under external IR radiation. V.V. Komarov, A.M. Popova, I.O. Stureiko, and H. Neumann	12	15
Study of discrete spectrum of radial Schrödinger equation with nuclear Coulomb potential. O.S. Pavlova and A.R. Frenkin	16	21
Possibility theoretical prediction of mean monthly temperature. Yu.P. Pyt'ev and I.V. Mazaeva	20	27
3-dimensional model of oxygen-nitrogen transport in porous diffuser of polymer electrolyte hydrogen fuel cell. K.V. Zhukovskii and V.Ch. Zhukovkii	23	32

Atomic and Nuclear Physics

Method of determination of radioactivity and particle parameters by semiconductor detector systems. Yu.V. Mineev	30	41
---	----	----

Acoustics and Molecular Physics

Proton transfer in catalytic center of serine proteinases (demonstrated with α -chymotrypsin). Yu.M. Romanovskii and E.V. Shuvalova	38	48
---	----	----

Solid-State Physics

Manifestation of quantum image forces of electrons in auto- and thermoelectronic emission at metal-dielectric interface. S.I. Beril and A.S. Starchuk	46	54
X-Ray microscopy with extremely asymmetric reflection from a crystal. A.V. Andreev and A.A. Konovko	49	60
Formation of Pd ₄ Tb ₃ intermetallic compound in the Pd-Tb system. A.S. Ilyushin, N.A. Khatanova, E.V. Silonova, G.S. Burkhanov, N. B. Kol'chugina, and O.D. Chistyakov	53	66
Magneto-optic garnet-ferrite films with high-speed response and thermostability. V.V. Randoshkin, A.M. Galkin, Yu.A. Durasova, V.A. Polezhaev, Yu.N. Sazhin, and N.N. Sysoev	62	73

Geophysics

Numerical experimental studies on gravitational-capillary convection in the near-the-surface layer of the ocean. V.B. Lapshin, A.A. Budnikov, E.V. Karavaeva, M.V. Panferov, and A.V. Sidorenko	65	78
The Earth's crust as an active neutron source. N.N. Volodichev, V.A. Zakharov, B.M. Kuzhevskii, O.Yu. Nechaev, and E.A. Sigaeva	69	84

Brief Communication

Atomic and Nuclear Physics

70-MeV racetrack microtron as a source of hard γ -radiation. V.K. Grishin, A.N. Ermakov, B.S. Ishkhanov, S.P. Likhachev, and V.I. Shvedunov	74	90
---	----	----

CONTENTS

VOLUME 57

NUMBER 6

2002

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Invited Review

- Problems of nonlinear dynamics: III. Local methods of time series forecasting.
A.Yu. Loskutov, O.L. Kotlyarov, I.A. Istomin, and D.I. Zhuravlev 3 1

Theoretical and Mathematical Physics

- Generalization of $1/N$ expansion in theories with matrix fields. D.V. Malyshev 26 28
A remark on the instability of eigenvalues of the Helmholtz equation. M.D. Malykh 29 33
Reduced description method in quantum statistical thermodynamics. P.N. Nikolaev 31 36

Atomic and Nuclear Physics

- Dynamics of molecules in a strong laser field under low dissociation conditions.
M.S. Molodenskii and O.V. Tikhonova 34 41

Solid-State Physics

- Magnetic ordering near crossover in singlet paramagnetic materials $\text{HoBa}_2\text{Cu}_3\text{O}_{7-\delta}$
($\delta = 0, 1.0$). Z.A. Kazei 43 47

Geophysics

- Analysis of seismotectonic strain in the Japan region. E.V. Voronina and A.V. Lyusina .. 47 53
Application of the measurement reduction method to mean monthly temperature prediction.
Yu.P. Pyt'ev and I.V. Mazaeva 52 59