

CONTENTS

VOLUME 56

NUMBER 1

2001

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Theoretical and Mathematical Physics

- Calculating β -function in the φ^4 -model in a wide range of coupling constant values.
V.V. Belokurov, Yu.P. Solovyev, E.T. Shavgulidze, and I.L. Yudin 3 1
- Problem of financial time series description. Linear homodynamic models. A.A. Bredikhin,
A.Yu. Loskutov, and A.B. Sedykh 10 7
- Effective Lagrangian for describing interference of magnetic and chromomagnetic fields.
V.Ch. Zhukovsky, V.V. Khudyakov, and A.S. Razumovsky 13 11
- Algorithm for processing sparse matrices arising when calculating waveguide systems.
A.N. Bogolyubov and V.V. Nagovitsyn 16 15
- Study of pseudospherical surface satisfying a two-soliton solution of sin-Gordon equation.
D.V. Tikhomirov 19 20
- Error estimation of solutions to some Cauchy problems for the Laplace equation.
V.N. Titarenko, A.G. Yagola, and N.N. Nikolaeva 21 24

Atomic and Nuclear Physics

- Lower limit for effective mass of alpha particle. B.I. Goryachev and N.V. Lin'kova 25 30
- Angular anisotropy of characteristic electromagnetic radiation of channeled ions in conditions of resonance coherent excitation. V.V. Balashov and I.V. Bodrenko 27 33

Optics and Spectroscopy

- Role of rhodamine 6G molecule associations in lasing processes. A.I. Akimov, A.N. Baranov,
L.V. Levshin, and A.M. Saletsky 30 38

Acoustics and Molecular Physics

- Generation and detection of shear waves in a rubber-like medium by means of focused ultrasound. V.G. Andreev and A.V. Vedernikov 34 44

Geophysics

- Nonlinear mechanism of tsunami generation by ocean floor oscillations. M.A. Nosov and
S.N. Skachko 44 48

Astronomy

- Evolution of orbits in three-body problem for Lindblad resonances in case of high eccentricities. I.A. Gerasimov and B.R. Mushailov 51 53

Brief Communications

Theoretical and Mathematical Physics

- Supersymmetrical Sutherland–Calogero model in an external field. D.V. Meshcheryakov
and V.B. Tverskoi 56 61

Atomic and Nuclear Physics

Shape of energy spectra of fast protons in channeling. L.L. Balashova	58	64
---	----	----

Optics and Spectroscopy

Amplitude optical nonreciprocity on excitation of stimulated Raman scattering in spatially heterogeneous nonlinear medium. N.V. Kravtsov, M.A. Melkumov, and N.I. Naumkin	60	68
---	----	----

Acoustics and Molecular Physics

Corrugation instability of shock wave in inhomogeneous gas. F.V. Shugaev and A.P. Kalinchenko	62	71
---	----	----

CONTENTS

VOLUME 56

NUMBER 2

2001

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Invited Review

- Problems of nonlinear dynamics: I. Chaos. A.Yu. Loskutov 3 1

Theoretical and Mathematical Physics

- Examples of computations in the framework of a new perturbation theory with convergent series. V.V. Belokurov, Yu.P. Solov'ev, E.T. Shavgulidze, and I.L. Yudin 23 23
- Mixed boundary problem of magnetized semiconductor physics in an external domain. A.O. Chikilev and P.A. Krutitskii 30 31

Optics and Spectroscopy

- Spectroscopic studies of the aggregation of biscyanine dyes in solutions. K.G. Blinova, A.A. Ishchenko, I.L. Mushkalo, S.V. Patsaeva, A.V. Pekhota, and V.I. Yuzhakov.. 34 37
- Measuring the optical characteristics of scattering media from the time profile of optical-acoustic signals. P.S. Grashin, A.A. Karabutov, I.M. Pelivanov, and N.B. Podymova 39 44
- Self-phase modulation and optical-harmonic generation in hollow fibers: simple recipes for a high efficiency. A.N. Naumov, O.A. Kolevatova, and A.M. Zheltikov 43 50

Solid-State Physics

- Crystal structure parameters of Pd_3Lu_2 intermetallide. A.S. Ilyushin, N.A. Khatanova, E.A. Rykova, and E.V. Silonova 47 56

Geophysics

- The role of the density structure of the near-water atmospheric layer in the atmosphere-ocean heat and mass exchange. A.A. Budnikov and G.G. Khundzhua 51 63

Brief Communications

Theoretical and Mathematical Physics

- The spectrum of the radial Schrödinger equation with an arbitrary attractive potential. O.S. Pavlova and A.R. Frenkin 57 66
- Gravitational search method for weakly luminous binary star systems. V.I. Denisov 59 69

Atomic and Nuclear Physics

- Electron shell effect in coherent polarization bremsstrahlung of fast electrons on light element atoms. V.K. Grishin, S.P. Likhachev, and G.S. Nefedov 60 72

CONTENTS

VOLUME 56

NUMBER 3

2001

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Invited Review

- Problems of nonlinear dynamics: II. Suppression of chaos and control of dynamical systems.
A.Yu. Loskutov 3 1

Theoretical and Mathematical Physics

- Passive scalar transfer in stochastic steady flow. S.V. Novikov and D.D. Sokolov 22 24
Threshold reactions in crossed constant electromagnetic field with nonzero invariant
 $E^2 - H^2$. V.N. Rodionov and A.M. Mandel 25 28
Calculating zeros of spherical Bessel functions and their derivatives. V.P. Modenov 29 34
Magnetic fields with nontrivial helicity and fermion zero modes. V.Ch. Zhukovsky and
I.V. Mamsurov 31 38

Atomic and Nuclear Physics

- Resonance profile in electron-atomic scattering via negative ion formation. V.V. Balashov 35 43

Radiophysics

- Detection of stochastic gravitational background in non-Gaussian additive noises.
A.V. Gusev and V.N. Rudenko 40 50

Optics and Spectroscopy

- Modulation method of generating classical squeezed states. Yu.E. D'yakov 43 54
Aperture effects in laser beams propagating through atmospheric channels with intermittent
turbulence. T.I. Arsenyan, A.M. Zotov, P.V. Korolenko, M.S. Maganova, and
A.V. Mesnyankin 46 58

Acoustics and Molecular Physics

- Dynamics of gas flows in long microchannels. K.V. Zhukovskii 49 64

Solid State Physics

- Relationship between exchange and relativistic energies defining linear magnetoelectric effect
in Cr_2O_3 antiferromagnet. S.S. Krotov and A.V. Lisnyak 58 70
Special features of dielectric response of triglycineselenate crystals near the Curie point.
N.D. Gavrilova, A.A. Zheleznyak, A.M. Lotonov, and V.K. Novik 61 74
Concentration of EL2 centres in GaAs single crystals grown from melts of various
compositions. V.A. Morozova, O.G. Koshelev, E.P. Veretenkin, V.N. Gavrin,
Yu.P. Kozlova, A.V. Markov, and A.Ya. Polyakov 66 81

Brief Communications

Theoretical and Mathematical Physics

Spectral properties of the problem about irregular waveguide. A.L. Delitsyn	75	87
---	----	----

Radiophysics

About generation of continuous key-streams in cryptographic communication symmetric systems. N.V. Evdokimov, V.P. Komolov, P.V. Komolov, and A.A. Rudenko	76	90
---	----	----

CONTENTS

VOLUME 56

NUMBER 4

2001

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Invited Review

- Nonlinear optics of gaseous media: breakthrough into ultrashort pulse region and use of new spectral regions. A.M. Zheltikov 3 1

Theoretical and Mathematical Physics

- The gravitational mass defect. Yu.M. Loskutov 29 33
Quark energy in a three-dimensional QCD model with a constant background field. V.Ch. Zhukovskii, N.A. Peskov, and S.A. Denisov 38 45
Self-adjoint Hamiltonians of scalar fields in the Schwarzschild metric. Ch. Aphantitis and S.V. Kalyashin 45 50
Estimating the end effects in heating a cylindrical sample in a finite solenoid. R.V. Budnik and V.B. Glasko 49 56

Radiophysics

- Detecting weak gravitational pulses against the anomalous noise background. A.V. Gusev, A.Yu. Kochetkova, and V.N. Rudenko 52 61

Acoustics and Molecular Physics

- Hydrodynamic instability of a planar flame front in a gas for low-frequency perturbations at arbitrary Lewis numbers. A.V. Uvarov, E.A. Savchenkova, and A.I. Osipov 57 66

Brief Communications

Optics and Spectroscopy

- Cluster speckle structures and Gabor's information diagram. Yu.V. Vasil'ev, A.V. Kozar', E.F. Kuritsyna, and A.E. Luk'yanov 60 70

Solid State Physics

- The high-temperature Staebler-Wronski effect in undoped high-resistance *a*-Si-H films. I.A. Kurova and N.N. Ormont 62 74

Geophysics

- The effect of turbulence on small solid particles in water suspension. Yu.G. Pyrkin, V.P. Petrov, I.N. Ivanova, and M.A. Silaev 65 78

Astronomy

- Nonplanar trajectories of motion of a spacecraft with a current element in the gravitational and magnetic fields of the Earth. V.I. Denisov and V.B. Pinchuk 70 82

CONTENTS

VOLUME 56

NUMBER 5

2001

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Theoretical and Mathematical Physics

Exact solutions of Dirac equation in strong external fields in 1+1 dimensions. O.F. Dorofeev and V.R. Khalilov	3	1
The method of integral functionals. V.V. Ternovskii and A.M. Khapaev	5	5
Neutron beta decay and lepton anomalous magnetic moment in an external field: from first studies to modern state. A.I. Studenikin	8	9
A mixed boundary problem of magnetized semiconductor physics in interior of domain. A.O. Chikilev and P.A. Krutitskii	16	19
Dissipative terms in quasi-gas-dynamic equations and their effect on shock wave flow field. T.G. Elizarova and M.E. Sokolova	19	24
Real resonances in a waveguide with nonhomogeneous filling. A.N. Bogolyubov, A.L. Delitsyn, and M.D. Malykh	23	29
Some mathematical models of immunology and their computer testing. A.A. Volodin, V.B. Glasko, E.A. Rovenskaya, and S.V. Rodionov	25	33
On resonance quantum limit for interference gravitational antenna. A.M. Chebotarev, A.V. Churkin, G.V. Ryzhakov, and A.M. Sinev	33	38
Determination of discrete spectrum of radial Schrödinger equation with arbitrary attracting potential. O.S. Pavlova and A.R. Frenkin	37	44

Atomic and Nuclear Physics

A method of measuring proton and helium nuclei energy by specific energy release in the maxima of hadronic cascades in dense matter. I.D. Rapoport, A.N. Turundaevsky, and V.Ya. Shestoperov	41	50
Antarctic balloon experiment on measuring cosmic rays of ultimate energies. R.A. Antonov, L.A. Kuzmichev, M.I. Panasyuk, D.V. Chernov, S.I. Nikolsky, and T.I. Sysoyeva .	44	55

Optics and Spectroscopy

Raman spectroscopy of an agglutinin ricin aqueous solution in the presence of guanidine chloride. N.N. Brandt, O.V. Voronina, Yu.A. Savochkina, A.I. Sotnikov, A.G. Tonevitsky, and A.Yu. Chikishev	51	59
---	----	----

Solid-State Physics

Focusing point defect generation wave along crystallographic axes in crystals under the action of Gaussian laser beam. V.I. Emel'yanov and A.V. Rogacheva	55	65
Exchange effects in a two-dimensional electron gas in a semiconductor at finite temperatures. A.G. Mironov	61	73

Astronomy

Electric fields in stars. V.I. Grigor'ev and V.S. Rostovskii	64	78
--	----	----

Brief Communications

Optics and Spectroscopy

Effective transformation of optical noise into monochromatic radiation and generation of squeezed states in media with cubic nonlinearity. Yu.E. D'yakov	69	82
--	----	----

CONTENTS

VOLUME 56

NUMBER 6

2001

MOSCOW UNIVERSITY PHYSICS BULLETIN

Pages
Russian/English

Theoretical and Mathematical Physics

Reduction of parametrically determined invariant measuring systems. P.V. Golubtsov and O.V. Starikova	3	1
Weyl quantization of dynamical systems with flat phase space. V.E. Tarasov	6	5
Correctness theorem for the boundary-value problem of scattering on an inhomogeneity in a layered medium. E.Yu. Eremina	10	11
Charged particle spin evolution in magnetic field. A.E. Lobanov, O.S. Pavlova, and G.A. Chizhov	12	15
Uniform approximation for exact solutions of ill-posed problems on the set of monotone functions. V.N. Titarenko and A.G. Yagola	21	20

Atomic and Nuclear Physics

Construction of higher-order corrections to the Kramers–Henneberger approximation. O.V. Smirnova and G.V. Smirnov	24	24
The role of spin selection rules in coherent η -meson photoproduction from nuclei in the baryon resonance region. M.M. Kaskulov and A.V. Bibikov	27	30
Studying high-energy cosmic rays by Cherenkov radiation generated by a charged particle in the upper atmosphere. D.M. Podorozhnyi, A.N. Turundaevskii, and V.Ya. Shestoperov	33	38

Radiophysics

Passage of wide-band nonlinear signals through a randomly inhomogeneous medium. V.A. Gusev and O.V. Rudenko	37	44
Amplitude-frequency noise suppression in detecting weak gravitational pulses. A.V. Gusev	41	51

Solid-State Physics

The effect of granule size distribution on the percolation threshold in granular alloys. A.B. Khanikaev, A.B. Granovskii, and J.-P. Clerc	49	56
The effect of illumination on parameters of microcrystalline hydrogenated silicon films with various boron doping levels. A.G. Kazanskii and P.A. Forsh	51	59
The Stark shifts of fluorescence band of dye molecules adsorbed in Langmuir–Blodgett ferroelectric films. V.B. Zaitsev, G.S. Plotnikov, and S.A. Rudneva	54	64

Geophysics

The core-diameter self-oscillation mechanism in intense convective vortices. E.P. Anisimova and A.A. Speranskaya	58	69
--	----	----

Astronomy

Conversion of the supernova energy into the mechanical energy of a star cluster. V.G. Surdin and L.A. Feoktistov	61	73
--	----	----

Brief Communication

Theoretical and Mathematical Physics

Trapping modes of waveguide systems. A.N. Bogolyubov, A.L. Delitsyn, and M.D. Malykh

65 79