

Few-Body Systems Group (Sector 11) at BLTP, JINR

2000 Annual Activity Report

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I. MAIN RESULTS

New algorithms for the explicit construction of multichannel quantum-mechanical Hamiltonians with desired spectral properties have been suggested [V. M. Chabanov, B. N. Zakhariev, I. V. Amirkhanov, *Ann. Phys. (N. Y.)* **285** (2000) 1].

The resonance transparency of repulsive barriers for bounded pairs of particles has been studied. It was shown that a local minimum of the total potential generates metastable bound states, and their spectrum determines the positions of maxima in the penetration probability. Another conclusion is that the probability of tunnelling of two interacting particles from a false vacuum can be considerably larger than it was assumed before [F. M. Pen'kov, *Phys. Rev.* **A62** (2000) 044701; *JETP* **118** (2000) 806 (Russian)].

Non-selfadjoint operators factorizing the transfer functions of a class of multichannel Hamiltonians have been constructed. This gave a possibility to prove completeness and basis properties for eigen- and root vectors of the transfer functions including those for the resonances [R. Mennicken, A. K. Motovilov, *Operator Theory: Advances and Applications* **118** (2000) 287].

A possibility of splitting of the two-body interactions and Faddeev components of the three-body wave function into physical and ghost terms has been discovered. The sum of physical terms of the interactions and the sum of Faddeev components are non-zero while in both cases the corresponding sum of the ghost terms is identical zero. Thus, the ghost terms do not effect on the physical observables. The presence of these terms is equivalent in fact to the existence of an additional conservation law corresponding to a new quantum number [V. V. Pupyshev, *Theor. Math. Phys.* **125** (2000) 253 (Russian)].

The body-fixed frame has been used to treat the three-body system with fixed angular momentum L . Given the total parity p of the three-body system, in such an approach one arrives with a set of $L + 1$ ($p = (-1)^L$) or L ($p = -(-1)^L$) 3-d equations. The vector-column variational primitives were introduced that allowed one to treat the matrix structure of these equations analytically. The pilot calculations in the new adiabatic approach based on this idea have been done. The numerical procedure for any L appears to be as simple as in the case of $L = 0$ [A.V. Matveenko, E.O. Alt, *Hyperfine Interactions* **127**, 143–147 (2000)]

The mechanism of formation of the Efimov states of the helium ^4He trimer has been studied when the force of the interatomic interaction is changed. It was shown that the Efimov levels arise from virtual levels which are in turn formed from (quasi)resonances settled on the real energy axis. The resonances including virtual levels are calculated by the method based on the solving the boundary value problem, at complex energies, for the Faddeev differential equations describing the scattering processes ($2 + 1 \rightarrow 2 + 1$; $1 + 1 + 1$). Among other things, it was shown that the excited state of the trimer is indeed a Efimov state [E. A. Kolganova, A. K. Motovilov, *Computer Phys. Commun.* **126** (2000) 88].

Effect of a drastical change of the Auger decay rate due to the wave-function mixture has been predicted for long-lived states of the antiprotonic helium. The effect takes place for the states whose energy is close to that of the specific short-lived ones. In the fall of 2000, after revival of the experimental programme in CERN,

this prediction has been confirmed by the ASACUSA collaboration [O. I. Kartavtsev, D. E. Monakhov, S. I. Fedotov, Phys. Rev. **A61** (2000) 062507].

Elastic ηd scattering has been considered within the AGS formalism for various ηN input data. A three-body resonant state was found close to the ηd threshold. This resonance is sustained for different choices of the two-body ηN scattering length $a_{\eta N}$. The position of the resonance moves towards the ηd threshold when $\text{Re } a_{\eta N}$ is increased, and turns into a quasi-bound state at $\text{Re } a_{\eta N} = 0.733$ fm [N. V. Shevchenko, V. B. Belyaev, S. A. Rakityansky, S. A. Sofianos, W. Sandhas, Eur. Phys. J. **A9** (2000) 143].

From the analysis of the recent JLab data for the reaction $p(e, e'p)\pi^0$ it was found that up to $Q^2 = 4.0(\text{GeV}/c)^2$ the extracted $\Delta(1232)$ resonance helicity amplitudes $A_{3/2}$ and $A_{1/2}$ remain comparable with each other, This implies that the hadronic helicity is not conserved and that the pQCD limit is not yet reached at the above range of Q^2 [S. S. Kamalov, S. N. Yang, Nucl. Phys. **A663** (2000) 405].

From the recently developed unitary isobar model for pion photo- and electroproduction on the proton it was learned that the forward spin polarizability γ_0 is particularly sensitive to the excitation of the $\Delta(1232)$ resonance [D. Drechsel, B. Pasquini, L. Tiator, S.S. Kamalov, G. Krein, Nucl. Phys. **A666** (2000) 286].

II. LIST OF PUBLICATIONS

A. JOURNAL PUBLICATIONS

1. V.M. Chabanov, B.N. Zakhariev, and I.V. Amirkhanov, “Toward the quantum design of multichannel systems”, *Annals of Physics* **285**, 1–24 (2000).
2. D. Drechsel, B. Pasquini, L. Tiator, S.S. Kamalov, and G. Krein, “Polarized structure functions of the nucleon in the resonance region”, *Nucl. Phys.* **A666**, 286–289 (2000)
3. S.S. Kamalov and S.N. Yang, “The Q^2 -dependence of $\gamma N \rightarrow \Delta$ transition form factors”, *Nucl. Phys.* **A663**, 405–408 (2000)
4. O.I. Kartavtsev, D.E. Monakhov, and S.I. Fedotov, “Auger decay rates of antiprotonic helium”, *Phys. Rev.* **A61**, 062507 (2000).
5. E.A. Kolganova and A.K. Motovilov, “Scattering and resonances in the ^4He three-atomic system”, *Computer Physics Communications* **126**, 88–92 (2000)
6. A.V. Matveenko and E.O. Alt, “Semianalytic wave functions for highly rotational states of antiprotonic He”, *Hyperfine Interactions* **127**, 143–147 (2000)
7. R. Mennicken and A.K. Motovilov, “Operator interpretation of resonances generated by some operator matrices”, *Operator Theory: Advances and Applications* **118**, 288–302 (2000)
8. F.M. Pen’kov, “Metastable states of a coupled pair on a repulsive barrier” *Phys. Rev.* **A62**, 044701–1–4 (2000)
9. F.M. Pen’kov “Quantum transparency of barriers for structural partiles”, *Zh. Eksp. Teor. Fiz.* **118**, 806–815 (2000) (*Russian*)
10. V.V. Pupyshev, “Spurious terms in the three-body problem”, *Theor. Math. Phys* **125**, 253–271 (2000) (*Russian*)
11. N.V. Shevchenko, V.B. Belyaev, S.A. Rakityansky, S.A. Sofianos, and W. Sandhas, “Low–energy ηd resonance”, *Eur. Phys. J.* **A9**, 143–146 (2000)

B. ARTICLES ACCEPTED FOR PUBLICATIONS

1. D. Drechsel, S.S. Kamalov, and L. Tiator. “The GDH sum rule and related integrals”, *Phys. Rev. C*
2. V. Hardt, R. Mennicken, and A.K. Motovilov, “Factorization theorem for the transfer function associated with a 2×2 operator matrix having unbounded couplings”, *J. Operator Theory*
3. S.S. Kamalov, E. Oset, and A. Ramos, “Chiral unitary approach to the K-deuteron scattering length”, *Nucl. Phys. A*
4. A.V. Matveenko, “Comment on Full ambiguity-free quantum treatment of $D^+ + H(1s)$ charge transfer reactions at low energies”, *Phys. Rev. Lett.*

5. A.V. Matveenko, “On diagonalization of the Coriolis Couplings”, *J. Phys. B*.
6. A.V. Matveenko, “Canonical three-body angular basis”, *Few-Body Systems*.
7. A.V. Matveenko, E.O. Alt, and H. Fukuda, “Rotational three-body resonances: a new adiabatic approach”, *Few-Body Systems Suppl.*
8. A.K. Motovilov, W. Sandhas, S.A. Sofianos, and E.A. Kolganova “Binding energies and scattering observables in the $^4\text{He}_3$ atomic system”, *European Phys. J.* **D13**, 33–41 (2001)
9. B.N. Zakhariev and V.M. Chabanov “Exact solutions for classical few-body systems from the multichannel quantum inverse problem”, *Few-Body Systems*

C. PREPRINTS AND DATA BASES

1. V.B. Belyaev, M.B. Miller, A.K. Motovilov, A.V. Sermyagin, I.V. Kuznetsov, Yu.G. Sobolev, A.A. Smolnikov, A.A. Klimenko, S.B. Osetrov, and S.I. Vasiliev, “Experimental search for molecular-nuclear transitions in water”, *LANL e-print nucl-ex/0001005*
2. V.M. Chabanov and B.N. Zakhariev, “On the qualitative theory of non-Gamov decay states”, *LANL e-print quant-ph/0011119*
3. D. Drechsel, S.S. Kamalov, and L. Tiator, “The GDH sum rule and related integrals”, *LANL e-print hep-ph/0008306*
4. S.S. Kamalov, E. Oset, and A. Ramos, “Chiral unitary approach to the K-deuteron scattering length”, *LANL e-print nucl-th/0010054*
5. S.S. Kamalov, S.N. Yang, D. Drechsel, O. Hanstein, and L. Tiator, “ $\gamma N \rightarrow \Delta$ transition form factors: A new analysis of the JLAB data on $p(e, e')\pi^0$ at $Q^2 = 2.8$ and 4.0 (GeV/c) 2 ”, *LANL e-print nucl-th/0006068*
6. Th. Pospischil, P. Bartsch, D. Baumann, J. Bermuth, R. Bohm, K. Bohinc, S. Derber, M. Ding, M. Distler, D. Drechsel, D. Elsner, I. Ewald, J. Friedrich, J.M. Friedrich, R. Geiges, S. Hedicke, P. Jennewein, M. Kahrau, S.S. Kamalov, F. Klein, K.W. Krygier, J. Lac, A. Liesenfeld, J. McIntyre, H. Merkel, P. Merle, U. Muller, R. Neuhausen, M. Potokar, R.D. Ransome, D. Rohe, G. Rosner, H. Schmieden, M. Seimetz, S. Sirca, I. Sick, A. Sule, L. Tiator, A. Wagner, Th. Walcher, G.A. Warren, and M. Weis, “Measurement of the recoil polarization in the $p(e, e')p\pi^0$ reaction at the $\Delta(1232)$ resonance”, *LANL e-print nucl-ex/0010020*
7. V.V. Pupyshev, “Exact solutions of the three-body problem with inverse square interactions”, *Preprint JINR, P5-2000-296, Dubna, 2000*
8. V.V. Pupyshev, “Physical and spurious terms of central two-body interactions”, *Preprint JINR, P4-2000-136, Dubna, 2000*
9. N. V. Shevchenko, V. B. Belyaev, S.A. Rakityansky, S.A. Sofianos, and W. Sandhas “Low energy scattering and photoproduction of η -mesons on deuterons”, *LANL e-print nucl-th/0011027*

D. CONFERENCE CONTRIBUTIONS

1. V.B. Belyaev, Yu.Z. Ionikh, M.B. Miller, A.K. Motovilov, A.V. Sermyagin, A.A. Smolnikov, and Yu.A. Tolmachev, “Experiments on sonoluminescence: Possible nuclear and QED aspects and optical applications”, *AIP Conference Proceedings* **524**, 413–416 (2000)
2. V.B. Belyaev, N.V. Shevchenko, S.A. Rakityansky, S.A. Sofianos, and W. Sandhas, “Microscopic description of η -nuclear systems”, to be published in Proceedings of International Workshop “Resonances in Few-Body Systems” (4–8 September 2000, Sarospatak, Hungary)
3. M. Braun and O.I. Kartavtsev, “Faddeev calculations for the three-electron quantum dot”, Contribution to Proceedings of the 16th International Conference on “Few-body Problems in Physics” (6–10 March 2000, Taipei, Taiwan)
4. M. Braun and O.I. Kartavtsev, “Faddeev calculations for the three-electron quantum dot”, Contribution to Proceedings of the XVII European Conference on Few-Body Problems in Physics (11–16 September 2000, Evora, Portugal).
5. V.M. Chabanov, “A theorem of M+1 spectra: New algorithms to control M-channel quantum systems”, Contribution to Proc. of the Conference of BLTP young scientists (1 November 2000, Dubna, Russia)
6. F. Gesztesy, K.A. Makarov, and A.K. Motovilov, “Monotonicity and concavity properties of the spectral shift function”, *Canadian Mathematical Society’s Conference Proceedings Series (Providence, RI)* **29**, 207–222 (2000) (LANL e-print math.SP/9909076).
7. V. Hardt, R. Mennicken, and A.K. Motovilov, “A factorization theorem for the transfer function associated with a 2×2 operator matrix having unbounded couplings”, Contribution (plenary talk by R. Mennicken) to the International Workshop on Operator Theory and Applications, IWOTA’2000 (12–15 September 2000, Faro, Portugal)
8. S.S. Kamalov and S.N. Yang, “A dynamical model for the resonant multipoles and the delta structure”, contribution to Proceedings of the NSTAR2000 Conference “Physics of Excited Nucleons” (16–19 February 2000, Newport News, Virginia, USA) *LANL e-print nucl-th/0005007*
9. E.A. Kolganova, A.K. Motovilov, and Y.K. Ho, “Complex scaling of the Faddeev operator”, talk at the 16th International Conference on Few-Body Problems in Physics (6–10 March 2000, Taipei, Taiwan), *LANL e-print nucl-th/0006085* (submitted to *Nucl. Phys. A*)
10. E.A. Kolganova, A.K. Motovilov, and Y.K. Ho, “Complex Scaling of the Faddeev Equations”, talk at the Second International Conference “Modern Trends in Computational Physics” (24–29 July 2000, Dubna, Russia), *LANL e-print physics/0011060*
11. A.K. Motovilov, W. Sandhas, S.A. Sofianos, and E.A. Kolganova, “Binding energies and scattering observables in the $^4\text{He}_3$ atomic system”, Contribution to Proc. of 16th International Conference on Few-Body Problems in Physics (6–10 March 2000, Taipei, Taiwan), *LANL e-print physics/0009035* (submitted to *Nucl. Phys. A*)

12. N.V. Shevchenko, V.B. Belyaev, S.A. Rakityansky, S.A. Sofianos, and W. Sandhas, “Near–threshold η d resonance”, Contribution to Proc. of 16th International Conference on Few–Body Problems in Physics (6–10 March 2000, Taipei, Taiwan)
13. N.V. Shevchenko, V.B. Belyaev, S.A. Rakityansky, S.A. Sofianos, and W. Sandhas, “Photoproduction of η -mesons off light nuclei”, to be published in Proceedings of XVIIth European Conference on Few–Body Problems in Physics (11–16 September 2000, Evora, Portugal)
14. N.V. Shevchenko, V.B. Belyaev, S.A. Rakityansky, S.A. Sofianos, and W. Sandhas, “Low energy scattering and photoproduction of η -mesons on deuterons”, to be published in Proceedings of IX International Seminar “Electromagnetic interactions of nuclei at low and medium energies” (20–22 September 2000, INR, Moscow, Russia)
15. L. Tiator, D. Drechsel, and S.S. Kamalov, “Pion electroproduction on the nucleon and the generalized GDH rule”, to be published in Proceedings of the NSTAR2000 Conference: “Physics of Excited Nucleons” (16–19 February 2000, Newport News, Virginia, USA), *LANL e-print nucl-th/0005061*

III. VISITS

A. CONFERENCES, SCHOOLS

1. V.B. Belyaev, International Workshop “Resonances in Few–Body Systems”, Sarospatak, Hungary, 4.09–8.09, 2000
2. S.S. Kamalov, the 16th International Conference on Few–Body Problems in Physics, Taipei, Taiwan, 06.03–10.03.2000
3. O.I. Kartavtsev International Workshop “Resonances in Few–Body Systems”, Sarospatak, Hungary, 4.09–8.09, 2000
4. M.Kh. Khankhasaev, Relativistic Heavy Ion Collider (RHIC) First Planning Workshop, Brookhaven National Laboratory, USA, 27.10–29.10.2000
5. M.Kh. Khankhasaev, Fifth International Symposium and Exhibition on Environmental Contamination in Central and Eastern Europe, Prague, Czech Republic, 12.09–14.09.2000
6. M.Kh. Khankhasaev, International Workshop on Technologies for Nuclear Separations: A Look to the Future, Prague, Czech Republic, 11.09.2000
7. M.Kh. Khankhasaev, International Decommissioning Symposium–2000, Knoxville, Tennessee, USA, 11.06–15.06.2000
8. M.Kh. Khankhasaev, International Conference of the American Institute of Hydrology, Raleigh Durham, North Carolina, USA, 05.11–09.11.2000
9. A.K. Motovilov, the 16th International Conference on Few–Body Problems in Physics, Taipei, Taiwan, 06.03–10.03.2000
10. N.V. Shevchenko, IV Open conference of young scientists, JINR, Dubna, 31.02–4.03.2000
11. N.V. Shevchenko, XVIIth European Conference on Few–Body Problems in Physics, Evora, Portugal, 11.09–16.09.2000
12. N.V. Shevchenko, IX International Seminar “Electromagnetic interactions of nuclei at low and medium energies”, INR, Moscow, Russia, 20.09–22.09.2000
13. B.N. Zakhariev, International Conference “Physics Beyond 2000”, Barcelona, Spain, 27.08–1.09.2000
14. B.N. Zakhariev, International Conference on Fundamental Sciences: Mathematics, Theoretical Physics, Singapore, 13.03–17.03.2000
15. B.N. Zakhariev, International Conference “Physics Beyond 2000”, Kaluga, Russia, 06.06–09.06.2000

B. COLLABORATION VISITS

1. M.V. Agaverdyev, Institute for Applied Mathematics, University of Bonn, Bonn, Germany, 15.11–15.12.2000
2. V.B. Belyaev, ECT, Trento, Italy, 01.10–19.11.2000
3. V.B. Belyaev, UNISA, Pretoria, South Africa, 22.11–23.12.2000
4. S.S. Kamalov, National Taiwan University, Taiwan, 01.03–01.6.2000
5. S.S. Kamalov, Institute of Nuclear Physics, Mainz University, Germany, 01.09–01.12.2000
6. O.I. Kartavtsev, Nuclear Physics Institute, Academy of Sciences of the Czech Republic, Řež near Prague, Czech Republic, 20.02–17.3.2000
7. M.Kh. Khankhasaev, Institute for International Cooperative Environmental Research, Florida State University, Tallahassee, Florida, USA, 01.01–31.12.2000
8. D.E. Monakhov, European Center for Theoretical Studies in Nuclear Physics and Related Areas, Trento, Italy, 01.10–12.11.2000
9. D.E. Monakhov, Aarhus University, Aarhus, Denmark, 25.11–3.12.2000
10. A.K. Motovilov, Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan, 11.03-26.03.2000
11. A.K. Motovilov, Nuclear Physics Institute, Academy of Sciences of the Czech Republic, Řež near Prague, Czech Republic, 02.05–07.05.2000
12. A.K. Motovilov, Department of Mathematics, University of Regensburg, Regensburg, Germany, 07.05-15.05.2000
13. A.K. Motovilov, Institute for Applied Mathematics, University of Bonn, Bonn, Germany, 15.05–15.08.2000
14. A.K. Motovilov, Max-Planck-Institut für Strömungsforschung, Göttingen, Germany, 23.07-25.07.2000
15. A.K. Motovilov, Physics Department, University of South Africa, Pretoria, South Africa, 01.11–30.11.2000
16. A.V. Matveenko, University of Mainz, Germany, 9.05–6.06.2000 and 2.12–16.12.2000
17. A.V. Matveenko, Politechnika, Wroclaw, Poland, 16.11–30.11.2000
18. F.M. Penkov, Institute for Nuclear Physics, Alama-Ata, Kazakhstan, 03.12–23.12.00

IV. VISITORS

1. M. Braun, Physics Department, University of South Africa, Pretoria, South Africa, 03.06–03.07.2000
2. M. Gorchshtein, Institute of Nuclear Physics, Mainz University, Germany, 23.07–07.08.2000
3. Y.K. Ho, Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan, 10.09–25.09.2000
4. J. Revai, CIFI, Budapest, Hungary, 15.05–27.05.2000

V. GRANTS

1. “Structure of the scattering matrix and resolvent in unphysical energy sheets and resonances in three-body quantum systems”, Grant from the Deutsche Forschungsgemeinschaft, DFG 436 RUS 113/570/1-1, 2000–2001 (S. Alberverio, A.K. Motovilov, S.M. Fei, S.L. Yakovlev, V.V. Agaverdyev)
2. “Pion Electroproduction and Nucleon Resonances”, Grant of the Heisenberg-Landau Program (S.S. Kamalov, D. Drechsel, L. Tiator and one student)
3. “Operator interpretation of resonances arising in spectral problems for 2×2 matrix hamiltonians”, Grant from the Heisenberg–Landau Program, HLP 2000-24, 2000 (R. Mennicken, A.K. Motovilov, V. Hardt, C. Tretter)
4. Grant of the Hungarian Academy of Sciences (J. Revai and V.B. Belyaev)
5. “Eta-nuclear interactions”, DFG–RFBR grant 98–02–04093, RUS 113/425/0 (R) (W. Sandhas, V.B. Belyaev, and S.A. Rakityansky)
6. “Creation of a server for accelerated access to information resources of the Internet”, Grant from the Russian Foundation for Basic Research, RFBR 00-07-90031, 2000–2002 (A.A. Sazonov, I.K. Sobolev, D.E. Monakhov, E.A. Kolganova)
7. “Operator models in problems of mathematical physics and their spectral analysis”, Grant from the Russian Foundation for Basic Research, RFBR 98-01-01000, 1998–2000 (A.A. Shkalikov, A.K. Motovilov, and Ph.D. students of the Mechanics and Mathematics Faculty, Moscow State University)
8. “Resonance states and scattering in few-body quantum systems: A further development of the cluster reduction method and representations for scattering matrix in unphysical sheets”, Grant from the Russian Foundation for Basic Research, RFBR 98-02-18190, 1998–2000 (S.L. Yakovlev, A.K. Motovilov, E.A. Kolganova, I.N. Filikhin, V.M. Suslov, S.B. Levin, and V.A. Roudnev)

VI. TEACHING

1. V.B. Belyaev, Supervisor of Ph. D. student N.V. Shevchenko (Irkustsk State University and BLTP, JINR)
2. A.K. Motovilov, Supervisor of Diploma student M.V. Agaverdyev (Irkustsk State University) who is now a Ph. D. student (Irkustsk State University and BLTP, JINR)
3. B.N. Zakhariev, Lecture courses at Moscow State University, Moscow Institute of Physics and Technology, and at Moscow Physics Engineering Institute

VII. ORGANIZATION ACTIVITY

1. V.B. Belyaev, Chairman of the International Workshop “Hot points in astrophysics”, Dubna, 22.08–26.08, 2000
2. V.B. Belyaev, Member of Organizing Committee of the International Workshop “Resonances in Few-Body Systems”, Sarospatak, Hungary, 4.09–8.09, 2000
3. V.B. Belyaev: Member of the BLTP NTS
4. V.B. Belyaev: Member of the BLTP C. Sc. and D. Sc. Panels.
5. M.Kh. Khankhasayev: Director of the Center for Russian-American Cooperative Environmental Research of ICEECER. Duties include day-to-day technical assistance to the Joint Coordinating Committee for Environmental Restoration and Waste Management (JCCEM Program) of the U.S. Department of Energy (DOE) and the Ministry of Atomic Energy of the Russian Federation (MINATOM), including the development and management of contracts, conducting topical workshops, and facilitating communication between the Russian and American Project Managers and Principal Investigators. The responsibilities also include managing of the cooperative environmental R&D program of Florida State University with leading Russian research and educational institutions, in particular, with Joint Institute for Nuclear Research, Dubna.
6. M.Kh. Khankhasayev: Member of Executive Committee of Fifth International Symposium and Exhibition on Environmental Contamination in Central and Eastern Europe (Prague 2000), Prague, Czech Republic, September 12–14, 2000.
7. M.Kh. Khankhasayev: Member of Organizing Committee of International Workshop on Technologies for Nuclear Separations: A Look to the Future, Prague, Czech Republic, 11 September 2000
8. M.Kh. Khankhasayev: Member of Organizing Committee of 10th Meeting of the Joint Coordinating Committee for Environmental Restoration and Waste Management (JCCEM), Prague, Czech Republic, September 13–14, 2000
9. M.Kh. Khankhasayev: Member of Organizing Committee of Joint U.S.–Russian JCCEM Induction-Heated Cold Crucible Melters Technology Workshop, Santa Fe, New Mexico, USA, 18–19 July 2000
10. M.Kh. Khankhasayev: Member of Organizing Committee of Joint U.S.–Russian JCCEM Deactivation and Decommissioning Workshop, Knoxville, Tennessee, USA, June 13, 2000
11. M.Kh. Khankhasayev: Member of Organizing Committee of the JCCEM Contaminant Transport Modeling and Vadose Zone Workshops, 7–8 November 2000
12. M.Kh. Khankhasayev: Member of Organizing Committee of the JCCEM U.S.–Russian Workshop on Decontamination of Plutonium Gloveboxes, Miamisburg, Ohio, USA, December 13–14, 2000
13. M.Kh. Khankhasayev: Member of Organizing Committee of the JCCEM U.S.–Russian Workshop on Tritium Decontamination Issues, Miamisburg, Ohio, USA, December 11–12, 2000

14. M.Kh. Khankhasayev: Member of Organizing Committee of Joint U.S.–Russian Meeting on Distance Methods for Determining Activity Density on a Surface, Idaho National Engineering and Environmental Laboratory (INEEL), Idaho Falls, Idaho, USA, March 18–25, 2000
15. M.Kh. Khankhasayev: Member of Organizing Committee of the Joint U.S.–Russian Workshop on Strippable and Non-Strippable Coatings for Possible Applications at the Mound DOE Facility, Miamisburg, Ohio, April 17–20, 2000
16. A.K. Motovilov: Member of the BLTP NTS
17. N.V. Shevchenko, Scientific secretary of the International Workshop “Hot points in astrophysics”, JINR, Dubna, 22.08–26.08.2000
18. B.N. Zakhariiev: Co-Chairman of the BLTP Professor Council
19. B.N. Zakhariiev: Member of the Board of the Moscow Physical Society