MR2919134 70G45 (70E15 70H06)
Shamolin, M. V. (RS-MOSC-IMC)
A complete list of first integrals in the problem of the motion of a four-dimensional body in a nonconservative field under linear damping. (Russian)
Dokl. Akad. Nauk **440** (2011), *no. 2,* 187–190.

{A review for this item is in process.}

MR2918863 70E15 (70K05)
Shamolin, M. V. (RS-MOSC-IMC)
A multiparameter family of phase portraits in the dynamics of a rigid body interacting with a medium. (Russian. English, Russian summaries)
Vestnik Moskov. Univ. Ser. I Mat. Mekh. **2011,** *no. 3,* 24–30.

{A review for this item is in process.}

MR2849353 70H06 (37N05 70G65)
Shamolin, M. V. (RS-MOSC-IMC)
A new case of integrability in the dynamics of a four-dimensional rigid body in a nonconservative field. (Russian)
Dokl. Akad. Nauk **437** (2011), *no. 2,* 190–193.

{There will be no review of this item.}

MR2786542 (2012k:37123) 37J35 (37N05 70H06)

Trofimov, V. V. (RS-MOSC); **Shamolin, M. V.** (RS-MOSC)

Geometric and dynamical invariants of integrable Hamiltonian and dissipative systems.

2076-6203
1573-8795
(Russian. English, Russian summaries)
Fundam. Prikl. Mat. **16** (2010), *no. 4,* 3–229; *translation in J. Math. Sci. (N. Y.)* **180** (2012), *no. 4,* 365–530.

This paper is related to the two D.Sc. theses of the authors on various aspects of the dynamics of integrable systems.

The first part of the paper is based on research carried out by Trofimov. In the first chapter a method for constructing completely integrable Hamiltonian systems on the coadjoint representation of Lie groups is proposed. Within this method new examples of completely integrable systems are constructed. This method makes it possible to prove the complete integrability of the equations, previously known as a multidimensional extension of the equations of magnetohydrodynamics. A theorem on the complete integrability of the Euler equations on tensor extensions of semisimple Lie algebras is proved. The second chapter is devoted to a geometric construction allowing one to classify Hamiltonian systems with first integrals. The construction mentioned is based on the extension of the Maslov class concept. Completely integrable systems with nontrivial generalized Maslov classes on the coadjoint orbits of Lie groups of small dimension are explored in Chapter 3.

The second part of the book is based on research carried out by Shamolin. Some classes of completely integrable non-conservative systems are investigated in Chapter 4. Systems under the action of non-conservative forces and variable dissipation are considered in Chapter 5. A system possessing a first integral which is a transcendental function of phase variables is pointed out. Some examples related to rigid body dynamics under the action of non-conservative forces are studied. Invariant indices characterizing countable sets of phase portraits are discussed. In Chapter 6, cases of the complete integrability of a four-dimensional dynamically symmetric top moving under the action of non-conservative forces are indicated.

Reviewed by *Alexander Burov*

AMERICAN MATHEMATICAL SOCIETY
MathSciNet® Mathematical Reviews on the Web
Article

Citations
From References: 0
From Reviews: 0

MR2759285 (2012a:65053) 65D30

Aĭdagulov, R. R. (RS-MOSC-IMC); **Shamolin, M. V.** (RS-MOSC-IMC)

Integration formulas of the tenth order of accuracy and higher. 1934-8444

(Russian. English, Russian summaries)

Vestnik Moskov. Univ. Ser. I Mat. Mekh. **2010,** *no. 4,* 3–7; *translation in Moscow Univ. Math. Bull.* **65** (2010), *no. 4,* 135–139.

Summary: “Nowadays, due to the considerable growth of computer capacity, the development of more efficient quadrature formulas may seem unnecessary. However, if the calculation of each integrand value requires much computational time or we have to study the dependence of the integral on a large number of parameters the integrand is determined through, then it is necessary to use more efficient formulas.”

MR2682718 (2012a:70010) 70E40 (70H06)

Shamolin, M. V. (RS-MOSC-IMC)

New integrability cases in the three-dimensional dynamics of a rigid body. (Russian)

Dokl. Akad. Nauk **431** (2010), *no. 3,* 339–343.

From the text (translated from the Russian): “The results of this paper are based on an investigation of ours of a problem of the motion of a rigid body in a resisting medium [*Methods for the analysis of dynamical systems with variable dissipation in the dynamics of a rigid body* (Russian), Èkzamen, Moscow, 2007; Fundam. Prikl. Mat. **14** (2008), no. 3, 3–237; MR2482029 (2010f:37032)], where we dealt with first integrals of dynamical systems with nonstandard properties. Specifically, the integrals were neither analytical nor smooth, and for certain sets, they were even discontinuous. These properties allowed us to thoroughly analyze all phase trajectories and to indicate the properties that possessed ‘structural stability’ and were preserved for systems of more general form with certain nontrivial symmetries of hidden type. Therefore, it is of interest to investigate a sufficiently large class of systems with similar properties, in particular, those involving the dynamics of a rigid body interacting with a medium. In this paper, we present new integrability cases in the problem of the three-dimensional dynamics of a rigid body in a resisting medium.”

MR2655252 (2011e:70008) 70E40 (34A05 37J35 70E45 70H06)

Shamolin, M. V. (RS-MOSC-MC)

The case of complete integrability in the dynamics of a four-dimensional rigid body in a nonconservative field. (Russian)

Uspekhi Mat. Nauk **65** (2010), *no. 1(391),* 189–190; *translation in Russian Math. Surveys* **65** (2010), *no. 1,* 183–185.

From the text (translated from the Russian): “We continue our search for new integrable cases in the dynamics of a four-dimensional rigid body in $\mathbb{R}^4 \times \mathrm{so}(4)$ in a nonconservative force field [M. V. Shamolin, Dokl. Akad. Nauk **375** (2000), no. 3, 343–346; MR1833828 (2002c:70005); D. V. Georgievskiĭ and M. V. Shamolin, Dokl. Akad. Nauk **380** (2001), no. 1, 47–50; MR1867984 (2003a:70002); M. V. Shamolin, *Methods for the analysis of dynamical systems with variable dissipation in the dynamics of a rigid body* (Russian), Izdat. “Èkzamen”, Moscow, 2007; per bibl.]. Earlier, we presented the case of complete integrability of the equations of motion of a dynamically symmetric body when $I_1 \neq I_2 = I_3 = I_4$ [op. cit., 2000]. In the present paper, we thoroughly analyze the case of another logically possible dynamic symmetry.”

References

1. ..., ... **375**:3 (2000), 343–346; English transl., M. V. Shamolin, *Dokl. Phys.* **45**:11 (2000), 632–634. MR1833828 (2002c:70005)
2. ..., ..., ... **380**:1 (2001), 47–50; English transl., D. V. Georgievskii and M. V. Shamolin, *Dokl. Phys.* **45**:9 (2001), 663–666.
3. ..., ... 2007. [M. V. Shamolin, *Methods of analysis of dynamical systems with varable dissipation in rigid body dynamics,* ‘Ekzamen’, Moscow 2007.]
4. ..., ..., ..., ... 1979; English transl., B. A. Dubrovin, A. T. Fomenko, and S. P. Novikov, *Modern geometry–methods and applications. Part* I. *The geometry of surfaces, transformation groups, and fields*, Graduate Texts in Math., vol. 93, Springer-Verlag, New York 1984; *Modern geometry–methods and applications. Part* II. *The geometry and topology of manifolds,* Graduate Texts in Math., vol. 104, Springer-Verlag, New York 1985; *Modern geometry–methods and applications. Part* III. *Introduction to homology theory,* Graduate Texts in Math., vol. 124, Springer-Verlag, New York 1990. MR0736837 (85a:53003)
5. ..., ..., 1984, no. 6, 31–33; English transl., V. V. Trofimov, *Mosc. Univ. Math. Bull.* **39**:6 (1984), 44–47.
6. ..., ... **287**:5 (1986), 1105–1109; English transl., O. I. Bogoyavlenskii, *Soviet Phys. Dokl.* **31**:3 (1986), 309–311. MR0839710 (87j:70005)
7. ..., ... **364**:5 (1999), 627–629; English transl., M. V. Shamolin, *Dokl. Phys.* **44**:2 (1999), 110–113. MR1702618 (2000k:70008)
8. ..., ... **53**:3 (1998), 209–210; English transl., M. V. Shamolin, *Russian Math. Surveys* **53**:3

(1998), 637–638. MR1657632 (99h:34006)

Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

MR2828400 (2012e:70013) 70E45 (70E15 70H06)

Shamolin, M. V. (RS-MOSC-MC)

Classification of complete integrability cases in the dynamics of a symmetric four-dimensional rigid body in a nonconservative field. 1573-8795

(Russian. Russian summary)

Sovrem. Mat. Prilozh. *No.* 65, *Matematicheskaya Fizika, Kombinatorika i Optimal′noe Upravlenie* (2009), 131–141; *translation in* *J. Math. Sci. (N. Y.)* **165** (2010), *no. 6,* 743–754.

Summary (translated from the Russian): “This paper is a relatively final result in the investigation of the equations of motion of a dynamically symmetric four-dimensional rigid body in two logically possible cases of its tensor of inertia in a nonconservative force field. The form of the force field considered is taken from the dynamics of real three-dimensional rigid bodies interacting with a medium.”

MR2828399 34A05

Okunev, Yu. M. (RS-MOSC-MC); **Shamolin, M. V.** (RS-MOSC-MC)

On the integrability in elementary functions of some classes of complex nonautonomous equations. (Russian. Russian summary)

Sovrem. Mat. Prilozh. *No.* 65, *Matematicheskaya Fizika, Kombinatorika i Optimal′noe Upravlenie* (2009), 121–130; *translation in* *J. Math. Sci. (N. Y.)* **165** (2010), *no. 6,* 732–742.

{There will be no review of this item.}

MR2828395 (2012d:76003) 76A02

Aĭdagulov, R. R. (RS-MOSC-MC); **Shamolin, M. V.** (RS-MOSC-MC)

Averaging operators and real equations of fluid mechanics. 1573-8795
(Russian. Russian summary)

Sovrem. Mat. Prilozh. *No.* 65, *Matematicheskaya Fizika, Kombinatorika i Optimal′noe Upravlenie* (2009), 31–46; *translation in* *J. Math. Sci. (N. Y.)* **165** (2010), *no. 6,* 637–653.

Summary (translated from the Russian): “We discuss pseudodifferential operators that appear in real equations of continuum mechanics.”

MR2828394 (2012e:35277) 35S05 (47G30 76T30)

Aĭdagulov, R. R. (RS-MOSC-MC); **Shamolin, M. V.** (RS-MOSC-MC)

Pseudodifferential operators in the theory of multiphase multivelocity flows. 1573-8795
(Russian. Russian summary)

Sovrem. Mat. Prilozh. *No.* 65, *Matematicheskaya Fizika, Kombinatorika i Optimal′noe Upravlenie* (2009), 11–30; *translation in* *J. Math. Sci. (N. Y.)* **165** (2010), *no. 6,* 616–636.

The article concerns methodological principles of the theory of mechanical systems. The authors show that the adequate description of multiphase multivelocity flows must use not differential but pseudodifferential equations and these equations must be hyperbolic.

Reviewed by *Yu. V. Egorov*

MR2676332 (2011g:37069) 37C99 (34C14 34M35 37E99 70E15)
Shamolin, M. V. (RS-MOSC-IMC)

On the integrability in elementary functions of some classes of nonconservative dynamical systems. (Russian. Russian summary)

Sovrem. Mat. Prilozh. No. 62, Geometriya i Mekhanika (2009), 130–170; *translation in J. Math. Sci. (N. Y.)* **161** (2009), *no. 5*, 734–778.

Summary (translated from the Russian): “The results in this paper are based on the investigation of the applied problem of the motion of a rigid body in a resisting medium [V. A. Samsonov, B. Ya. Lokshin and V. A. Privalov, “Qualitative analysis” (Russian), Sci. Rep. Inst. Mech. Moscow State Univ. No. 3425, Moskov. Gos. Univ., Moscow, 1985; per bibl.; V. A. Samsonov et al., “Mathematical modeling in the problem of the deceleration of a body in a resisting medium in the case of a jet flow around the body” (Russian), Sci. Rep. Inst. Mech. Moscow State Univ. No. 4396, Moskov. Gos. Univ., Moscow, 1995; per bibl.], in which complete lists of transcendental first integrals expressed in terms of a finite combination of elementary functions were obtained. This made it possible to thoroughly analyze all the phase trajectories and to determine which of their properties possess structural stability and which are preserved in systems of more general form. The complete integrability of such systems is related to hidden symmetries. Therefore, it is of interest to study sufficiently wide classes of dynamical systems that have similar hidden symmetries.

“As is known, the concept of integrability is, in general, fairly broad. Thus, it is necessary to take into account in what sense it is understood (a criterion according to which one can conclude that the structure of the trajectories of the dynamical system considered is especially ‘attractive and simple’) in the function classes in which the first integrals are sought, etc.

“In this paper, we use an approach in which the first integrals are transcendental functions, and in fact elementary. Here transcendence is understood not in the sense of elementary functions (for example, trigonometric) but in the sense that they have essentially singular points (according to the classification used in the theory of functions of one complex variable in the case when the function has essentially singular points). In this connection, it is necessary to continue them formally to the complex plane. As a rule, such systems are strongly nonconservative.”

References

1. S. A. Agafonov, D. V. Georgievskii, and M. V. Shamolin, ”Some actual problems of geometry and mechanics”, In: *Abstract of Sessions of Workshop Actual Problems of Geometry and Mechanics, Contemporary Mathematics. Fundamental Directions* [in Russian], Vol. 23 (2007), p. 34.
2. G. A. Al’ev, ”Spatial problem of submegence of a disk in an incompressible fluid,” *Izv. Akad. Nauk SSSR, Mekh. Zh. Gaz.* **1**, 17–20 (1988).
3. V. V. Amel’kin, N. A. Lukashevich, and A. R Sadovskii, *Nonlinear Oscillations in Second-Order Systems* [in Russian], BGU, Minsk (1982).
4. A. A. Andronov, *Collection of Works* [in Russian], Izd. Akad. Nauk SSSR, Moscow (1956).
5. A. A. Andronov and E. A. Leontovich, ”To theory of variations of qualitative structure of plane

partition into trajectories," *Dokl. Akad. Nauk SSSR*, **21**, No. 9 (1938).
6. A. A. Andronov and E. A, Leontovich, "Birth of limit cycles from a nonrough focus or center and from a nonrough limit cycle," *Math. Sb.* **40**, No. 2 (1956). MR0085413 (19,36a)
7. A. A. Andronov and E. A. Leontovich, "On birth of limit cycles from a separatrix loop and from separatrix of saddle-node equilibrium state," *Mat. Sb.*, **48**, No. 3 (1959). MR0131612 (24 #A1461)
8. A. A. Andronov and E. A. Leontovich, "Dynamical systems of the first degree of non-roughness on the plane," *Mat. Sb.*, **68**, No. 3 (1965). MR0194657 (33 #2866)
9. A. A. Andronov and E. A. Lentovich, "Sufficient conditions for non-roughness of the first degree of a dynamical system on the plane," *Differents. Uravn.*, **6**, No. 12 (1970).
10. A. A. Andronov and L. S. Pontryagin, "Rough systems," *Dokl. Akad. Nauk SSSR*, **14**, No. 5, 247–250 (1937).
11. A. A. Andronov, A. A. Vitt, and S. E. Khaikin, *Oscillation Theory* [in Russian], Nauka, Moscow (1981). MR0665745 (83i:34002)
12. A. A. Andronov, E. A. Leontovich, I. I. Gordon, and A. G. Maier, *Qualitative Theory of Second-Order Dynamical Systems* [in Russian], Nauka, Moscow (1966). MR0199506 (33 #7650)
13. A. A. Andronov, E. A. Leontovich, I. I. Gordon, and A. G. Maier, *Bifurcation Theory of Dynamical Systems on the Plane* [in Russian], Nauka, Moscow (1967). MR0235228 (38 #3539)
14. P. Appel, *Theoretical Mechanics*, Vols. I, II [Russian translation], Fizmatgiz, Moscow (1960).
15. S. Kh. Aranson, "Dynamical systems on two-dimensional manifolds," In: *Proceedings of the 5th International Conference on Nonlinear Oscillations*, Vol. 2 [in Russian], Institute of Mathematics, Academy of Sciences of UkrSSR (1970).
16. S. Kh. Aranson and V. Z. Grines, "Topological classification of flows on two-dimensional manifolds," *Usp. Mat. Nauk*, **41**, No. 1 (1986). MR0832412 (87j:58075)
17. V. I. Arnol'd, "Hamiltionian property of Euler equations of rigid body dynamics in ideal fluid," *Usp. Mat. Nauk*, **24**, No. 3, 225–226 (1969). MR0277163 (43 #2900)
18. V. I. Arnol'd, *Additional Chapters of Theory of Ordinary Differential Equations* [in Russian], Nauka, Moscow (1978). MR0526218 (80i:34001)
19. V. I. Arnol'd, *Ordinary Differential Equations* [in Russian], Nauka, Moscow (1984). MR0799024 (86i:34001)
20. V. I. Arnol'd, *Mathematical Methods of Classical Mechanics* [in Russian], Nauka, Moscow (1989). MR1037020 (93c:70001)
21. V. I. Arnol'd, V. V. Kozlov, and A. I. Neishtadt, "Mathematical aspects of classical and celestial mechanics," In: *Progress in Science and Technology, Series on Contemporary Problems in Mathematics, Fundamental Direction* [in Russian], Vol. 3, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (1985).
22. Yu. A. Arkhangel'skii, *Analytical Rigid Body Dynamics* [in Russian], Nauka, Moscow (1977).
23. D. Arrowsmith and C. Place, *Ordinary Differential Equations. Qualitative Theory with Applications* [Russian translation], Mir, Moscow (1986).
24. I. M. Babakov, *Oscillation Theory* [in Russian], Nauka, Moscow (1965). MR0187444 (32 #4894)
25. V. I. Babitskii and V. L. Krupenin, *Oscillations in Strongly Nonlinear Systems* [in Russian],

Nauka, Moscow (1985). MR0833070 (88f:70021)
26. E. A. Barbashin and V. A. Tabueva, *Dynamical Systems With Cylindrical Phase Space* [in Russian], Nauka, Moscow (1969). MR0338509 (49 #3273)
27. N. N. Bautin, "On approximation and roughness of the parameter space of a dynamical system," In: *Proceedings of the 5th International Conference on Nonlinear Oscillations* [in Russian], Institute of Mathematics and Mechanics, UkrSSR Academy of Sciences, Kiev (1970).
28. N. N. Bautin, "Certain methods for qualitative studying dynamival systems related to a field turn," *Prikl. Mat. Mekh.*, **37**, No. 6 (1973). MR0361262 (50 #13708)
29. N. N. Bautin and E. A. Leontovich, *Methods and Tools for Qualitative Studying Dynamical Systems on the Plane* [in Russian], Nauka, Moscow (1976). MR0466732 (57 #6609)
30. V. V. Beletskii, *Satellite Motion with Respect to Center of Masses in Gravitational Field* [in Russian], MGU, Moscow (1975).
31. A. V. Belyaev, "On many-dimensional body motion with clamped point in gravity force field," *Mat. Sb.*, **114**, No. 3, 465–470 (1981). MR0610209 (82i:58027)
32. I. Bendixon, "On curves defined by differential equations," *Usp. Mat. Nauk*, **9** (1941).
33. M. Berger, *Geometry*, Vols. I, II [Russian translation], Mir, Moscow (1984). MR0807773 (86k:51001a)
34. A. L. Besse, *Manifolds Whose All Geodesies Are Closed* [Russian translation], Mir, Moscow (1981). MR0641690 (83i:53059)
35. J. Birkhoff, *Dynamical Systems* [Russian translation], Gostekhizdat, Moscow-Leningrad (1941).
36. R. L. Bishop, *Oscillations* [Russian translation], Nauka, Moscow (1986).
37. G. A. Bliss, *Lectures on the Calculus of Variations* [Russian translation], Gostekhizdat, Moscow-Leningrad (1941).
38. Magnus Blix, "Une nouvelle theorie sur le vol a viole des oiseaux," In: *Revue Generale Sciences Pures et Appliquees* (1890).
39. O. I. Bogoyavlenskii, *Methods of Qualitative Theory of Dynamical Systems in Astrophysics and Gas Dynamics* [in Russian], Nauka, Moscow (1980). MR0604548 (84f:85007)
40. O. I. Bogoyavlenskii, "Some integrable cases of Euler equation," *Dokl. Akad. Nauk SSSR*, **287**, No. 5, 1105–1108 (1986). MR0839710 (87j:70005)
41. O. I. Bogoyavlenskii and G. F. Ivakh, "Topological analysis of integrable cases of V. A. Steklov," *Usp. Mat. Nauk*, **40**, No. 4, 145–146 (1985). MR0807729 (87g:58035)
42. S. V. Bolotin "On first integrals of systems with gyroscopic forces," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **6**, 75–82 (1984). MR0775310 (86j:70012)
43. S. V. Bolotin and V. V. Kozloy, "On asymptotic solutions of dynamics equations," *Vestn. MGU, Ser. 1, Mar., Mekh.*, **4**, 84–89 (1980).
44. I. T. Borisenok, B. Ya. Lokshin, and V. A. Privalov, "On flight dynamics of axially-symmetric rotating bodies in air medium *Izv. Akad Nauk SSSR, Mekhanika Tverdogo Tela*, **2**, 35–42 (1984).
45. A. V. Brailov, "Some cases of complete integrability of Euler equations and applications," *Dokl. Akad. Nauk SSSR*, **268**, No. 5, 1043–1046 (1983). MR0697820 (84m:58050)
46. A. D. Bryuno, *Local Method of Nonlinear Analysis of Differential Equations* [in Russian],

Nauka, Moscow (1979). MR0542758 (82b:34033)
47. N. Bourbaki, *Integration* [Russian translation], Nauka, Moscow (1970). MR0274688 (43 #450)
48. A. A. Burov, "Non-integrability of equations of satellite plane oscillations on an elliptic orbit," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **1**, 71–73 (1984). MR0735960 (85a:70053)
49. A. A. Burov and G. I. Subkhankulov, "On rigid body motion in magnetic field," *Prikl. Mat. Mekh.*, **50**, No. 6, 960–966 (1986).
50. N. N. Butenina, "Separatrix bifurcations of a two-dimensional dynamical system under a turn of field," In: *Qualitative Methods of Theory of Differential Equations and Their Applications, Scientific Notes of Gor'kii State University* [in Russian], **187** (1973). MR0594952 (58 #28852a)
51. N. N. Butenina, "Bifurcations of separatrices and limit cycles of a two-dimensional dynamical system under a turn of field," *Differents. Uravn.*, **9**, No. 8 (1973). MR0333332 (48 #11657)
52. N. N. Butenina, "To bifurcation theory of dynamical systems under a turn of field," *Differents. Uravn.*, **10**, No. 7 (1974). MR0357960 (50 #10425)
53. N. N. Butenina, "On possibility of a turn of dynamical system vector field by an angle with passage only through systems of first non-roughness degree," In: *Inter-Colleges Collection "Oscillation Theory, Applied Mathematics, and Cybernetics,"* [in Russian], Gor'kii (1974).
54. N. N. Bukhgolts, *Basic Course of Theoretical Mechanics* [in Russian], Vols. I, II, Nauka, Moscow (1972).
55. G. S. Byushgens and R. V. Studnev, *Dynamics of Longitudinal and Lateral Motion* [in Russian], Mashinostroenie, Moscow (1969).
56. G. S. Byushgens and R. V. Studnev, *Airplane Dynamics. A Spatial Motion* [in Russian], Mashinostroenie, Moscow (1988).
57. M. L. Byalyi, "On first integrals polynomial in impulses for a mechanical system on a two-dimensional torus," *Funkts. Anal. Pril.*, **21**, No. 4, 64–65 (1987). MR0925074 (89c:70029)
58. S. A. Chaplygin, "On motion of heavy bodies in an incompressible fluid," In: *A Complete Collection of Works* [in Russian], Vol. 1, Izd. Akad. Nauk SSSR, Leningrad (1933), pp. 133–135.
59. S. A. Chaplygin, *Selected Works* [in Russian], Nauka, Moscow (1976). MR0424502 (54 #12464)
60. F. L. Chernous'ko, L. D. Akulenko, and B. N. Sokolov, *Control of Oscillations* [in Russian], Nauka, Moscow (1980).
61. E. A. Coddington and N. Levinson, *Theory of Ordinary Differential Equations* [Russian translation], IL, Moscow (1958).
62. S. A. Dovbysh, "Intersection of asymptotic surfaces of a perturbed Euler-Poinsot problem," Prikl. Mat. Mekh., **51**, No. 3, 363–370 (1987). MR0960031 (89g:70005)
63. S. A. Dovbysh, "Separatrix splitting and birth of isolated periodic solutions in Hamiltonian systems with one and a half degrees of freedom," *Usp. Mat. Nauk*, **44**, No. 2, 229–230 (1989). MR0998366 (90i:58140)
64. S. A. Dovbysh, "Splitting of separatrices of unstable uniform rotations and non-integrability of a perturbed Lagrange problem," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **3**, 70–77 (1990). MR1064299 (92d:70005)
65. B. A. Dubrovin and S. P. Novikov, "On Poisson brackets of hydrodynamic type," *Dokl. Akad.*

Nauk SSSR, **279**, No. 2, 294–297 (1984). MR0770656 (86e:58021)
66. B. A. Dubrovin, S. P. Novikov, and A. T. Fomenko, *Modern Geometry. Theory and Applications* [in Russian], Nauka, Moscow (1979). MR0566582 (81f:53001)
67. H. Dulac, *On Limit Cycles* [Russian translation], Nauka, Moscow (1980). MR0597517 (82k:34031)
68. G. E. Dzhakal'ya, *Perturbation Theory Methods for Linear Systems* [in Russian], Nauka, Moscow (1967).
69. V. A. Eroshin, "Submergence of a disk into a compressible fluid at an angle to a free surface," *Izv. Akad. Nauk SSSR, Mekhanika Zhidkosti Gaza*, **2**, 142–144 (1983).
70. V. A. Eroshin, "Penetration of an elastic cylinder into water at a high speed," *Preprint*, No. 5, Insitute of Mechanics, Moscow State University, Moscow (1991).
71. V. A. Eroshin, "Experimental study of entrance of an elastic cylinder into water at a high speed," *Izv. Ross. Akad. Nauk, Mekhanika Zhidkosi Gaza*, **5**, 20–30 (1992).
72. V. A. Eroshin, V. A. Privalov, and V. A. Samsonov, "Two model problems of body motion in a resisting medium," In: *Collection of Scientific-Methodological Papers in Theoretical Mechanics* [in Russian], Issue 18, Nauka, Moscow (1987), pp. 75–78.
73. V. A. Eroshin, V. A. Samsonov, and M. V. Shamolin, "On body motion under streamline flow around," In: *Abstracts of All-Union Conference on Stability of Motion, Oscillations of Mechanical Systems, and Aerodynamics, Moscow, February 2–4, 1988* [in Russian], Moscow Aviation Institute, Moscow (1988), p. 21.
74. V. A. Eroshin, V. A. Samsonov, and M. V. Shamolin, "Mathematical modelling in problem of body drag in a medium under streamline flow around," In: *Abstracts of Chebyshev Readings, Vestn. MGU, Ser. 1, Mat., Mekh.*, **6**, 17 (1995).
75. V. A. Eroshin, V. A. Samsonov, and M. V. Shamolin, "Model problem of body grag in a resisting medium under streamline flow around," *Izv. Ross. Akad. Nauk, Mekhanika Zhidkosti Gaza*, **3**, 23–27 (1995).
76. V. A. Eroshin, G. A. Konstantinov, N. I. Romanenkov, and Yu. L. Yakimov, "Experimental finding of hydrodynamic force moment under a asymmetric penetration of a disk into a compressible fluid," *Izv. Ross. Akad. Nauk, Mekhanika Zhidkosti Gaza*, **5**, 88–94 (1990).
77. V. A. Eroshin, N. I. Romanenkov, I. V. Serebryakov, and Yu. L. Yakimov, "Hydrodynamic forces under a shock of blunt bodies on compressible fluid surface," *Izv. Ross. Akad. Nauk, Mekhanika Zhidkosti Gaza*, **6**, 44–51 (1980).
78. R. R. Fakhrutdinova and M. V. Shamolin, "On preservation of phase volume in 'zero mean' variable dissipation systems," In: *Abstracts of Sessions of Workshop 'Actual Problems of Geometry and Mechanics,' Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 22.
79. A. T. Fomenko, "Realization of cycles in compact symmetric spaces by totally geodesic submanifolds," *Dokl. Akad. Nauk SSSR*, **195**, No. 4, 789–792 (1970). MR0276997 (43 #2735)
80. A. T. Fomenko, "Complete integrability of certain classical Hamiltonian systems," In: *Monogenic Functions and Mappings*, Institute of Mathematics, UkrSSR Academy of Sciences, Kiev (1982), pp. 3–19. MR0701707 (84k:58115)
81. F. R. Gantmakher, *Lectures on Analytical Mechanics* [in Russian], Nauka, Moscow (1960)

82. D. V. Georgievskii and M. V. Shamolin, "On kinematics of a rigid body with a fixed point in $\mathbb{R}^n$," In: *Abstracts of Sessions of Workshop "Actual Problems of Geometry and Mechanics,"* *Fund. Prikl. Mat.*, **7**, No. 1 (2001), p. 315.
83. D. V. Georgievskii and M. V. Shamolin, "Kinematics and mass geometry of a rigid body with a fixed point in $\mathbb{R}^n$," *Dokl. Ross. Akad. Nauk*, **380**, No. 1, 47–50 (2001). MR1867984 (2003a:70002)
84. D. V. Georgievskii and M. V. Shamolin, "Generalized dynamical Euler equations for a rigid body with a fixed point in $\mathbb{R}^n$," *Dokl. Ross. Akad. Nauk*, **383**, No. 5, 635–637 (2002). MR1930111 (2003g:70008)
85. D. V. Georgievskii and M. V. Shamolin, "First integrals of equations of motion for a generalized gyroscope in $\mathbb{R}^n$," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **5**, 37–41 (2003). MR2042218 (2004j:70012)
86. D. V. Georgievskii, M. V. Shamolin, and V. V. Trofimov, "Valerii Vladimirovich Trofimov," In: *Abstract of Sessions of Workshop Actual Problems of Geometry and Mechanics, Contemporary Mathematics. Fundamental Directions* [in Russian], Vol. 23 (2007), pp. 5–6. MR2342521
87. D. V. Georgievskii and M. V. Shamolin, "On kinematics of a rigid body with a fixed point in $\mathbb{R}^n$," In: *Abstract of Sessions of Workshop Actual Problems of Geometry and Mechanics, Contemporary Mathematics. Fundamental Directions* [in Russian], Vol. 23 (2007), pp. 24–25.
88. D. V. Georgievskii and M. V. Shamolin, "Generalized dynamical Euler equations for a rigid body with a fixed point in $\mathbb{R}^n$," In: *Abstract of Sessions of Workshop Actual Problems of Geometry and Mechanics, Contemporary Mathematics. Fundamental Directions* [in Russian], Vol. 23 (2007), p. 30.
89. D. V. Georgievskii and M. V. Shamolin, "First integrals for equations of motion of a generalized gyroscope in n-dimensional space," In: *Abstract of Sessions of Workshop Actual Problems of Geometry and Mechanics, Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 31.
90. D. V. Georievskii, V. V. Trofimov, and M. V. Shamolin, "Geometry and mechanics: problems, approaches, and methods," In: *Abstracts of Sessions of Workshop "Actual Problems of Geometry and Mechanics," Fund. Prikl. Mat.*, **7**, No. 1 (2001), p. 301.
91. D. V. Georgievskii, V. V. Trofimov, and M. V. Shamolin, "On certain topological invariants of flows with complex potential," In: *Abstracts of Sessions of Workshop "Actual Problems of Geometry and Mechanics," Fund. Prikl. Mat.*, **7**, No. 1 (2001), p. 305.
92. D. V. Georgievskii, V. V. Trofimov, and M. V. Shamolin, "Geometry and mechanics: problems, approches, and methods," In: *Abstract of Sessions of Workshop Actual Problems of Geometry and Mechanics, Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 16.
93. D. V. Georgievskii, V. V. Trofimov, and M. V. Shamolin, "On certain topological invariants of flows with complex potential," In: *Abstract of Sessions of Workshop Actual Problems of Geometry and Mechanics, Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 19.
94. E. B. Gledzer, F. S. Dolzhanskii, and A. M. Obukhov, *Systems of Hydrodynamic Type and Their Applications* [in Russian], Nauka, Moscow (1981). MR0647315 (83e:76002)

95. C. Godbillon, *Differential Geometry and Analytical Mechanics* [Russian translation], Mir, Moscow (1973).
96. V. V. Golubev, *Lectures on Analytical Theory of Differential Equations* [in Russian], Gostekhizdat, Moscow-Leningrad (1950). MR0014552 (7,301a)
97. V. V. Golubev, *Lectures on Integrating Equations of Heavy Body Motion Around a Fixed Point* [in Russian], Gostekhizdat, Moscow-Leningrad (1953).
98. G. V. Gorr, L. V. Kudryashova, and L. A. Stepanova, *Classical Problems of Rigid Body Dynamics* [in Russian], Naukova Dumka, Kiev (1978). MR0519067 (80m:70001)
99. D. N. Goryachev, "New cases of integrability of dynamical Euler equations," *Varshav. Univ. Izv.*, **3**, 1–15 (1916).
100. I. S. Gradshtein and I. M. Ryzhik, *Tables of Integrals, Series Sums, and Derivatives* [in Russian], Gostekhizdat, Moscow (1963).
101. E. A. Grebennikov and Yu. A. Ryabov, *Constructive Methods of Analysis of Nonlinear Systems* [in Russian], Nauka, Moscow (1979).
102. Ph. Griffits, *Exterior Differential Systems and the Calculus of Variations* [Russian translation], Mir, Moscow (1986). MR0879421 (89b:58016)
103. D. M. Grobman, "On homeomorphism of systems of differential equations," *Dokl. Akad. Nauk SSSR*, **128**, No. 5, 880–881 (1959). MR0121545 (22 #12282)
104. D. M. Grobman, "Topological classification of neighborhoods of a singular point in n-dimensional space," *Mat. Sb.*, **56**, No. 1, 77–94 (1962). MR0138829 (25 #2270)
105. D. A. Gudkov, "On concept of non-roughness and degrees of non-roughness for plane algebraic curves," *Mat. Sb.*, **67**, No. 4 (1965). MR0196584 (33 #4771)
106. M. I. Gurevich, *Jet Theory of Ideal Fluid* [in Russian], Nauka, Moscow (1979).
107. Ph. Hartman, *Ordinary Differential Equations* [Russian translation], Mir, Moscow (1970). MR0352574 (50 #5061)
108. C. Hayashi, *Nonlinear Oscillations in Physical Systems* [Russian translation], Mir, Moscow (1968).
109. Airy Hubert, *The Soaring of Birds*, "Nature," Vol. XXVIII, 1.596.
110. T. A. Ivanova, "On Euler equations in models of theoretical physics," *Mat. Zametki*, **52**, No. 2, 43–51 (1992). MR1187873 (93i:58032)
111. Yu. S. Il'yashenko, "Memoir 'On Limit Cycles' of Dulac and relative problems of local theory of differential equations," *Usp. Mat. Nauk*, **40**, No. 6 (1995). MR0815489 (87j:34052)
112. A. Yu. Ishlinskii, *Orientation, Gyroscopes, and Inertial Navigation* [in Russian], Nauka, Moscow (1976).
113. A. Yu. Ishlinskii and D. M. Klimov, "Some aspects of the solution of the main problem of inertial navigation," *J. Inst. Navig.*, **23**, No. 4 (1970).
114. C. Jacobi, *Lectures on Dynamics* [Russian translation], ONTI, Moscow-Leningrad (1936).
115. A. B. Katok, "Dynamical systems with hyperbolic structure," In: *9th Summer Mathematical School* [in Russian], Kiev (1972), pp. 125–211. MR0377991 (51 #14160)
116. Ch. Kittel, W. D. Knight, and M. A. Ruderman, *Berkeley Physics Course, Vol.* 1. *Mechanics* [Russian translation], Nauka, Moscow (1983).
117. V. V. Kozlov, *Qualitative Analysis Methods in Rigid Body Dynamics* [In Russian], MGU,

Moscow (1980).
118. V. V. Kozlov, "Hydrodynamics of Hamiltonian Systems," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **6**, 10–22 (1983). MR0728549 (85e:58048)
119. V. V. Kozlov, "A note on stationary vortex motions of a continuous medium," *Prikl. Mat. Mekh.*, **47**, No. 2, 341–342 (1983). MR0740637 (85c:76023)
120. V. V. Kozlov, "Integrability and non-integrability in Hamiltonian mechanics," *Usp. Mat. Nauk*, **38**, No. 1, 3–67 (1983). MR0693718 (84k:58076)
121. V. V. Kozlov, "To problem of rigid body rotation in magnetic field," *Izv. Akad. Nauk SSSR, Mekhanika Tverdogo Tela*, **6**, 28–33 (1985).
122. V. V. Kozlov, "On rigid body fall in ideal fluid," *Izv. Akad. Nauk SSSR, Mekhanika Tverdogo Tela*, **5**, 10–17 (1989).
123. V. V. Kozlov, "Vortex theory of a top," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **4**, 56–62 (1990). MR1086606 (93d:58055)
124. V. V. Kozlov, "To problem of heavy rigid body fall in a resisting medium," *Vestn. MGU, Ser. 1, Mat, Mekh.*, **1**, 79–87 (1990). MR1064287 (91m:76041)
125. V. V. Kozlov, "On stochastization of ideal fluid plane-parallel flows," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **1**, 72–76 (1991).
126. V. V. Kozlov and N. N. Kolesnikov, "On integrability of Hamiltonian systems," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **6**, 88–91 (1979). MR0561414 (81c:58037)
127. V. V. Kozlov and D. A. Onishchenko, "Non-integrability of Kirchhoff equations," *Dokl. Akad. Nauk SSSR*, **266**, No. 6, 1298–1300 (1982). MR0681629 (84e:58033)
128. N. N. Kolesnikov, "Natural systems with solvable symmetry group," *Vestn. MGU, Ser. 1, Mat, Mekh.*, **5**, 99–103 (1978). MR0516027 (80b:70007)
129. A. N. Kolmogorov, "General theory of dynamical systems and classical mechanics," In: *International Mathematical Congress in Amsterdam* [in Russian], Fizmatgiz, Moscow (1961), pp. 187–208.
130. M. A. Krasnosel'skii, A. I. Perov, A. I. Povolotskii, and P. P. Zabreiko, *Vector Fields on Plane* [in Russian], Fizmatgiz, Moscow (1963).
131. N. M. Krylov and N. N. Bogolyubov, *New Methods of Nonlinear Mechanics* [in Russian], ONTI, Moscow-Leningrad (1934).
132. N. M. Krylov and N. N. Bogolyubov, *An Introduction to Nonlinear Mechanics* [in Russian], Izd. Akad. Nauk. SSSR, Moscow (1937).
133. A. G. Kushnirenko, "Problems of general theory of dynamical systems on manifolds," In: *9th Summer Mathematical School* [in Russian], Kiev (1972), pp. 52–124.
134. G. Lamb, *Hydrodynamics* [Russian translation], Fizmatgiz, Moscow (1947).
135. L. D. Landau and E. M. Lifshits, *Mechanics* [in Russian], Nauka, Moscow (1968). MR0389014 (52 #9846)
136. S. Lefschetz, *Geometric Theory of Differential Equations* [Russian translation], IL, Moscow (1961).
137. S. Lang, *An Introduction to Theory of Differentiable Manifolds* [Russian translation], Mir, Moscow (1967).
138. E. A. Leontovich, "To problem of definition of rough dynamical system," In: *Nonlinear Vibra-*

tion Problems, Second Conference on Nonlinear Vibrations [in Russian], Warsaw (1964).
139. E. A. Leontovich and A. G. Maier, "On trajectories determining the qualitative structure of partition a sphere into trajectories, *Dokl. Akad. Nauk SSSR*, **14**, No. 5 (1937).
140. E. A. Leontovich and A. G. Maier, "On scheme determining topological structure of partition into trajectories," *Dokl. Akad. Nauk SSSR*, **103**, No. 4 (1955).
141. E. A. Leontovich and L. P. Shil'nikov, "Modern state of art of bifurcation theory for dynamical systems." In: *Qualitative Methods of Nonlinear Oscillation Theory* [in Russian], Vol. 2, Institute of Mathematics, UkrSSR Akademy of Sciences (1970).
142. J. U. Leech, *Classical Mechanics* [Russian translation], IL, Moscow (1961).
143. B. Ya. Lokshin, "On a certain motion of a rapidly rotating body in the air," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **6**, 93–98 (1970).
144. Otto Liliental, *Der Vogelflug als Grundlage der Fliegekunst*, Berlin (1889), p. 81.
145. B. Ya. Lokshin, "On stability of plane motion of a rapidly rotating symmetric body in the atmosphere," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **6**, 113–118 (1971).
146. B. Ya. Lokshin, "On skrew motion of a rapidly rotating symmetric rigid body in the air," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **4**, 79–86 (1973).
147. B. Ya. Lokshin, V. A. Privalov, and V. A. Samsonov, *An Introduction to Problem of Motion of a Bogy in a Resisting Medium* [in Russian], MGU, Moscow (1986).
148. B. Ya. Lokshin, V. A. Privalov, and V. A. Samsonov, *An Introduction to Problem of Motion of a Body and a Point in a Resisting Medium* [in Russian], MGU, Moscow (1992).
149. B. Ya. Lokshin, Yu. M. Okunev, V. A. Samsonov, and M. V. Shamolin, "Some integrable cases of rigid body spatial oscillations in a resisting medium," In: *Abstracts of Reports of XXI Scientific Readings in Cosmonautics, Moscow, January 28–31, 1997* [in Russian], Institute of History of Natural Sciences and Technics, Russian Academy of Sciences, Moscow (1997), pp. 82–83.
150. V. V. Lunev, "A hydrodynamical analogy of problem of rigid body motion with a fixed point in Lorenz force field," *Dokl. Akad. Nauk SSSR*, **276**, No. 2, 351–355 (1984). MR0745042 (85i:78009)
151. A. M. Lyapunov, "A new integrability case of equations of rigid body motion in a fluid," In: *A Collection of Works* [in Russian], Vol. I, Izd. Akad. Nauk SSSR, Moscow (1954), pp. 320–324.
152. I. G. Malkin, *Some Problems of Nonlinear Oscillation Theory* [in Russian], Gostekhteorizdat, Moscow (1956).
153. Yu. I. Manin, "Algebraic aspects of theory of nonlinear differential equations," In: *Progress in Science and Technology, Series on Contemporary Problems in Mathematics* [in Russian], Vol. 11, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (1978), pp. 5–112.
154. E.-J. Marey, *Le Vol des Oiseaux. Chap.XX*, Paris (1890), p. 157.
155. A. P. Markeev, "On integrability of problem of ball rolling with a multiconnected hole filled with ideal fluid," *Izv. Akad. Nauk SSSR, Mekhanika Tverdogo Tela*, **1**, 64–65 (1986).
156. A. P. Markeev, *Theoretical Mechanics* [in Russian], Nauka, Moscow (1990). MR1070718 (91g:70001)
157. J. Marsden and M. McCracken, *The Hopf Bifurcation and Its Applications* [Russian translation],

Mir, Moscow (1986).
158. W. Miller, *Symmetry and Separation of Variables* [Russian translation], Mir, Moscow (1981). MR0645900 (83a:58098)
159. Yu. A. Mitropol'skii and A. K. Lopatin, "Asymptotic decomposition of systems of ordinary differential equations with small parameter," *Preprint*, Instsitute of Mathematics, UkrSSR, Academy of Sciences, No. 86–71, Kiev (1986). cf. MR 88c:34056
160. Yu. A. Mitropol'skii and O. B. Lykova, *Integral Manifolds in Nonlinear Mechanics* [in Russian], Nauka, Moscow (1973). MR0364771 (51 #1025)
161. N. N. Moiseev, *Asymptotic Methods of Nonlinear Mechanics* [in Russian], Nauka, Moscow (1969). MR0645354 (83i:70001)
162. N. N. Moiseev and V. V. Rumyantsev, *Dynamics of a Body with Holes Containing a Fluid* [in Russian], Nauka, Moscow (1965)..
163. L. Mouillard, *L'Empire de l'Air*, Paris (1881).
164. Yu. I. Neimark, "On motions close to a double-asymptotic motion," *Dokl. Akad. Nauk SSSR*, **172**, No. 5, 1021–1024 (1967). MR0209601 (35 #498)
165. Yu. I. Neimark, "Structure of motion of a dynamical system in a neighborhood of a homoclinic curve," In: *5th Summer Mathematical School* [in Russian], Kiev (1968), pp. 400–435.
166. Yu. I. Neimark and N. A. Fufaev, *Dynamics of Nonholonomic Systems* [in Russian], Nauka, Moscow (1967).
167. V. V. Nemytskii and V. V. Stepanov, *Qualitative Theory of Differential Equations* [in Russian], Gostekhizdat, Moscow-Leningrad (1949).
168. Z. Nitetski, *Introduction to Differential Dynamics* [Russian translation], Mir, Moscow (1975). MR0649789 (58 #31211)
169. S. P. Novikov and I. Schmeltzer, "Periodic solutions of Kirchhoff equations of body and ideal fluid free motion and extended Lyusternik-Shnirel'man-Morse theory," *Funct. Anal. Pril.*, **15**, No. 3, 54–66 (1981). MR0630339 (83a:58026a)
170. Yu. M. Okunev and V. A. Sadovnichii, "Model dynamical systems of a certain problem of external ballistics and their analytical solutions," In: *Problems of Modern Mechanics* [in Russian], MGU, Moscow (1998), pp. 28–46.
171. Yu. M. Okunev, V. A. Privalov, and V. A. Samsonov, "Some problems of body motion in a resisting medium," *Proceedings of All-Union Conference 'Nonlinear Phenomena'* [in Russian], Nauka, Moscow (1991), pp. 140–144.
172. Yu. M. Okunev, V. A. Sadovnichii, V. A. Samsonov, and G. G. Chernyi, "A complex for modelling flight dynamics problems," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **6**, 66–75 (1996).
173. Bret Onniere, *Etude sur le Vol Plane*, L'Aeronaute (1891).
174. J. Palais and S. Smale, "Structural stability theorems," In: *A Collection of Translations. Mathematics*, **13**, No. 2 (1969), pp. 145–155.
175. J. Palis and W. De Melu, *Geometric Theory of Dynamical Systems. An Introduction* [Russian translation], Mir, Moscow (1986). MR0848132 (87m:58048)
176. A. Parseval, *Die Mechanik des Vogelflugs*, Wisbaden (1889), p. 122.
177. S. E. Peal, *The Soaring of Birds*, "Nature," Vol. XXVIII, 1.11.
178. M. Peixoto, "On structural stability," *Ann. Math.*, **2**, No. 69, 199–222 (1959). MR0101951 (21

#753)
179. M. Peixoto, ”Structural stability on two-dimensional manifolds,” *Topology*, **1**, No. 2, 101–120 (1962). MR0142859 (26 #426)
180. M. Peixoto, ”On an approximation theorem of Kupka and Smale,” *J. Differential Equations*, **3**, 214–227 (1966). MR0209602 (35 #499)
181. A. M. Perelomov, ”Several remarks on integration of equations of rigid body motion in ideal fluid,” *Funkts. Anal. Pril.*, **15**, No. 2, 83–85 (1981). MR0617480 (82j:58066)
182. I. G. Petrovskii, *Lectures on Theory of Ordinary Differential Equations* [in Russian], Gostekhizdat, Moscow-Leningrad (1952). MR0775134 (86b:34002)
183. V. A. Pliss, ”On roughness of differential equations given on a torus,” *Vestn. LGU, Ser. Mat.*, **13**, 15–23 (1960). MR0126588 (23 #A3884)
184. V. A. Pliss, *Nonlocal Problems of Oscillation Theory* [in Russian], Nauka, Moscow-Leningrad (1964). MR0171962 (30 #2188)
185. V. A. Pliss, *Integral Sets of Periodic Systems of Differential equations* [in Russian], Nauka, Moscow (1967).
186. V. A. Pliss, ”On stability of an arbitrary system with respect to perturbations small in C sense,” *Differents. Uravn.*, **16**, No. 10, 1891–1892 (1980). MR0595574 (82b:34068)
187. T. I. Pogosyan, ”Construction of bifurcation sets in a certain problem of rigid body dynamics,” *Izv. Akad. Nauk SSSR, Mekhanika Tverdogo Tela*, **12**, 9–16 (1980). MR0571420 (83b:70004)
188. H. Poincaré, *On Curves Defined by Differential Equations* [Russian translation], OGIZ, Moscow-Leningrad (1947).
189. H. Poincaré, ”New methods in celestial mechanics,” In: *Selected Works* [Russian translation], Vols. 1, 2, Nauka, Moscow (1971–1972).
190. H. Poincaré, *On Science* [Russian translation], Nauka, Moscow (1983). MR0745803 (85k:01056)
191. L. Prandtl and A. Betz, *Ergebmisse der Aerodinamishen Versuchsastalt zu Gottingen*, b.4 Liefrung, München-Berlin; R. Oldenbourg (1932), p. 148.
192. V. A. Privalov and V. A. Samsonov, ”On stability of motion of a body auto-rotating in medium flow,” *Izv. Akad. Nauk SSSR, Mekhanika Tverdogo Tela*, **2**, 32–38 (1990).
193. J. W. Rayleigh, *The Soaring of Birds*, ”Nature,” Vol. XXVIII, 1.534.
194. R. Reissing, G. Sansone, and R. Conti, *Qualitative Theory of Ordinary Differential Equations* [Russian translation], Nauka, Moscow (1974).
195. V. E. Ryzhova and M. V. Shamolin, ”On some analogies in problem of body motion in a resisting medium,” In: *Seventh Congress in Theoretical and Applied Mechanics, Moscow, August 15–21, 1991* [in Russian], Moscow (1991).
196. S. T. Sadetov, ”Integrability conditions of Kirchhoff equations,” *Vestn. MGU, Ser. 1, Mat., Mekh.*, **3**, 56–62 (1990). MR1064298 (91m:58081)
197. T. V. Sal’nikova, ”On integrability of Kirchhoff equations in symmetric case,” *Vestn. MGU, Ser. 1, Mat., Mekh.*, **4**, 68–71 (1985). MR0806340 (87i:70008)
198. V. A. Samsonov, ”On stability of solutions of systems of differential equations in some cases,” *Vestn MGU, Ser. 1, Mat., Mekh.*, **5**, 74–78 (1962). MR0144023 (26 #1571)
199. V. A. Samsonov, ”On stability of equilibrium of physical pendulum with fluid filling,” *Prikl.*

Mat. Mekh., **30**, No. 6, 1112–1114 (1966).
200. V. A. Samsonov, "On problem of minimum of a functional in studying stability of motion of a body with fluid filling," *Prikl. Mat. Mekh.*, **31**, No. 3, 523–526 (1967). MR0238519 (38 #6795)
201. V. A. Samsonov, "On quasi-stationary motions of mechanical systems," *Izv. Akad. Nauk SSSR, Mekhanika Tverdogo Tela*, **1**, 32–50 (1978). MR0536257 (80e:70017)
202. V. A. Samsonov, "On body rotation in magnetic field," *Izv. Akad. Nauk SSSR, Mekhanika Tverdogo Tela*, **4**, 32–34 (1984).
203. V. A. Samsonov and M. V. Shamolin, "To problem on body motion in a resisting medium," *Vestn. MGU, Ser. 1, Mat, Mekh.*, **3**, 51–54 (1989). MR1029730 (90k:70007)
204. V. A. Samsonov and M. V. Shamolin, "On body motion in a resisting medium," In: *Contemporary Problems of Mechanics and Technologies of Machine Industry, All-Union Conference, April, 16–18, 1989. Abstracts of Reports* [in Russian], All-Union Institute for Scientific and Technical Information, Moscow (1989), pp. 128–129.
205. V. A. Samsonov and M. V. Shamolin, "A model problem of body motion in a medium with streamline flow around," In: *Scientific Report of Institute of Mechanics, Moscow State University* [in Russian], No. 3969, Institute of Mechanics, Moscow State University, Moscow (1990).
206. V. A. Samsonov and M. V. Shamolin, "A model problem of body motion in a medium with streamline flow around," In: *Nonlinear Oscillations of Mechanical Systems, Abstract of Reports of II All-Union Conference, September, 1990*, Pt. 2 [in Russian], Gor'kii (1990), pp. 95–96.
207. V. A. Samsonov and M. V. Shamolin, "To problem on body drag in a medium under streamline flow around," In: *Scientific Report of Institute of Mechanics, Moscow State University* [in Russian], No. 4141, Institute of Mechanics, Moscow State University, Moscow (1991).
208. V. A. Samsonov and M. V. Shamolin, "On stability of a body under its drag in a resisting medium," In: *VII Chetaev Conference 'Analytical Mechanics, Stability, and Control of Motion', June 10–13, 1997. Abstracts of Reports*, Kazan' State Technical University, Kazan' (1997), p. 24.
209. V. A. Samsonov, V. A. Eroshin, G. A. Konstantinov, and V. M. Makarshin, "Two model problems on body motion in a medium under streamline flow around," In: *Scientific Report of Institute of Mechanics, Moscow State University* [in Russian], No. 3427, Institute of Mechanics, Moscow State University, Moscow (1987).
210. V. A. Samsonov, B. Ya. Lokshin, and V. A. Privalov, "Qualitative analysis," In: *Scientific Report of Institute of Mechanics, Moscow State University* [in Russian], No. 3245, Institute of Mechanics, Moscow State University (1985).
211. V. A. Samsonov, M. V. Shamolin, V. A. Eroshin, and V. M. Makarshin, "Mathematical modelling in problem of body drag in resisting medium under streamline flow around," In: *Scientific Report of Institute of Mechanics, Moscow State University* [in Russian], No. 4396, Moscow (1995).
212. G. Sansone, *Ordinary Differential Equations* [Russian translation], IL, Moscow (1954).
213. L. I. Sedov, *Continuous Medium Mechanics* [in Russian], Vols. 1, 2, Nauka, Moscow (1983–1984).
214. H. Seifert and W. Threifall, *Topology* [Russian translation], Gostekhizdat, Moscow-Leningrad

(1938).
215. N. Yu. Seiivanova and M. V. Shamolin, ”Extended Cahn-Hillard model and certain its solutions,” In: *Materials of Voronezh All-Russion Conference ‘Pontryagin Readings-XVIII,’ Voronezh, May, 2007* [in Russian], Voronezh State University, Voronezh (2007), pp. 145–146.
216. M. V. Shamolin, *Qualitative Analysis of a Model Problem of Body Motion in a Medium with Streamline Flow Around* [in Russian], Candidate Dissertation, MGU, Moscow (1991).
217. M. V. Shamolin, ”Closed trajectories of different topological type in problem of body motion in a medium with resistance,” *Vestn. MGU, Ser. 1, Mat., Mekh.*, **2**, 52–56 (1992). MR1293705 (95d:34060)
218. M. V. Shamolin, ”To problem of body motion in a medium with resistance,” *Vestn. MGU, Ser. 1, Mat., Mekh.*, **1**, 52–58 (1992). MR1214592 (93k:70028)
219. M. V. Shamolin, ”Classification of phase portraits in problem of body motion in a resisting medium under presence of a linear damping moment,” *Prikl. Mat. Mekh.*, **57**, No. 4, 40–49 (1993). MR1258007 (94i:70027)
220. M. V. Shamolin, ”A new two-parameter family of phase portraits for problem of a body motion in a resisting medium,” In: *Modelling and Study of Stability of Systems, Scientific Conference, May 24–28, 1993. Abstracts of Reports, Pt. 2* [in Russian], Znanie, Kiev (1993), pp. 62–63.
221. M. V. Shamolin, ”Relative structural stability of problem of body motion in a resisting medium,” In: *Mechanics and Its Applications, Scientific Conference, November 9–11, 1993, Abstracts of Reports*, Tashkent State University, Tashkent (1993), pp. 20–21.
222. M. V. Shamolin, ”Applications of Poincaré topographical system methods and comparison systems in some concrete systems of differential equations,” *Vestn. MGU, Ser. 1, Mat., Mekh.*, **2**, 66–70 (1993). MR1223987 (94b:34060)
223. M. V. Shamolin, ”Existence and uniqueness of trajectories having infinitely distant points as limit sets for dynamical systems on plane,” *Vestn. MGU, Ser. 1, Mat., Mekh.*, **1**, 68–71 (1993). MR1293942 (95e:34036)
224. M. V. Shamolin, ”A new two-parameter family of phase portraits in problem of a body motion in a medium,” *Dokl. Ross. Akad. Nauk*, **337**, No. 5, 611–614 (1994). MR1298329 (95g:70006)
225. M. V. Shamolin, ”On relative roughness of dynamical systems in problem of body motion in a medium under streamline flow around,” In: *Modelling and Study of Stability of Systems, Scientific Conference, May 16–20, 1994, Abstract of Reports* [in Russian], Kiev (1994), pp. 144–145.
226. M. V. Shamolin, ”A new two-parameter family of phase portraits with limit cycles in rigid body dynamics interacting with a medium,” In: *Modelling and Study of Stability of Systems, Scientific Conference, May 15–19, 1995, Abstracts of Reports (Study of Systems)* [in Russian], Kiev (1995), p. 125.
227. M. V. Shamolin, ”Relative structural stability of dynamical systems for problem of body motion in a medium,” In: *Analytical, Numerical, and Experimental Methods in Mechanics. A Collection of Scientific Works* [in Russian], MGU, Moscow (1995), pp. 14–19. MR1809236
228. M. V. Shamolin, ”On relative roughness of dynamical systems in problem of body motion in a resisting medium,” In: *Abstracts of Reports of Chebyshev Readings, Vestn. VGU, Ser. 1, Mat., Mekh.*, **6**, 17 (1995).

229. M. V. Shamolin, ”Definition of relative roughness and two-parameter family of phase portraits in rigid body dynamics,” *Usp. Mat. Nauk*, **51**, No. 1, 175–176 (1996). MR1392692 (97f:70010)
230. M. V. Shamolin, ”Periodic and Poisson stable trajectories in problem of body motion in a resisting medium,” *Izv. Ross. Akad. Nauk, Mekhanika Tverdogo Tela*, **2**, 55–63 (1996).
231. M. V. Shamolin, ”Spatial Poincaré topographical systems and comparison systems,” In: *Abstracts of Reports of Mathematical Conference ‘Erugin Readings,’ Brest, May 14–16, 1996* [in Russian], Brest (1996), p. 107. MR1479402 (99a:34089)
232. M. V. Shamolin, ”Introduction to spatial dynamics of rigid body motion in resisting medium.” In: *Materials of International Conference and Chebyshev Readings Devoted to the 175th Anniversary of P. L. Chebyshev, Moscow, May 14–19, 1996, Vol. 2* [in Russian], MGU, Moscow (1996), pp. 371–373.
233. M. V. Shamolin, ”A list of integrals of dynamical equations in spatial problem of body motion in a resisting medium,” In: *Modelling and Study of Stability of Systems, Scientific Conference, May 20–24, 1996. Abstracts of Reports (Study of Systems)*, [in Russian], Kiev (1996), p. 142.
234. M. V. Shamolin, ”Variety of types of phase portraits in dynamics of a rigid body interacting with a resisting medium,” *Dokl. Ross. Akad. Nauk*, **349**, No. 2, 193–197 (1996). MR1440994 (98b:70009)
235. M. V. Shamolin, ”Qualitative methods in dynamics of a rigid body interacting with a medium,” In: *II Siberian Congress in Applied and Industrial Mathematics, Novosibirsk, June 25–30, 1996. Abstracts of Reports. Pt. III* [in Russian], Novosibirsk (1996), p. 267.
236. M. V. Shamolin, ”On a certain integrable case in dynamics of spatial body motion in a resisting medium,” In: *II Symposium in Classical and Celestial Mechanics. Abstracts of Reports, Velikie Luki, August 23–28, 1996* [in Russian], Moscow-Velikie Luki (1996), pp. 91–92.
237. M. V. Shamolin, ”Introduction to problem of body drag in a resisting medium and a new two-parameter family of phase portraits,” *Vestn. MGU, Ser. 1, Mat., Mekh.*, **4**, 57–69 (1996). MR1644665 (99e:70027)
238. M. V. Shamolin, ”On an integrable case in spatial dynamics of a rigid body interacting with a medium,” *Izv. Ross. Akad. Nauk, Mekhanika Tverdogo Tela*, **2**, 65–68 (1997).
239. M. V. Shamolin, ”Jacobi integrability of problem of a spatial pendulum placed in over-running medium flow,” In: *Modelling and Study of Systems. Scientific Conference, May, 19–23, 1997. Abstracts of Reports* [in Russian], Kiev (1997), p. 143.
240. M. V. Shamolin, ”Partial stabilization of body rotational motions in a medium under a free drag,” In: *Abstracts of Reports of All-Russian Conference with International Participation ‘Problems of Celestial Mechanics,’ St. Petersburg, June 3–6, 1997, Institute of Theoretical Astronomy* [in Russian], Institute of theoretical Astronomy, Russian Academy of Sciences, St. Petersburg (1997), pp. 183–184.
241. M. V. Shamolin, ”Spatial Poincaré topographical systems and comparison systems,” *Usp. Mat. Nauk*, **52**, No. 3, 177–178 (1997). MR1479402 (99a:34089)
242. M. V. Shamolin, ”Mathematical modelling of dynamics of a spatial pendulum flowing around by a medium,” In: *Proceedings of VII International Symposium ‘Methods of Discrete Singularities in Problems of Mathematical Physics’, June 26–29, 1997, Feodociya* [in Russian], Kherson State Technical University, Kherson (1997), pp. 153–154.

243. M. V. Shamolin, ”Spatial dynamics of a rigid body interacting with a medium,” In: *Workshop in Mechanics of Systems and Problems of Motion Control and Navigation, Izv. Ross. Akad. Nauk, Mekhanika Tverdogo Tela*, **4**, 174 (1997).
244. M. V. Shamolin, ”Qualitative methods in dynamics of a rigid body interacting with a medium,” In: *YSTM'96: 'Young People and Science, the Third Millenium,' Proceedings of International Conference (Ser. Professional)* [in Russian], Vol. 2, NTA ”APFN,” Moscow (1997), pp. I-4.
245. M. V. Shamolin, ”Qualitative and numerical methods in some problems of spatial dynamics of a rigid body interacting with a medium,” In: *Abstracts of Reports of 5th International ConferenceWorkshop 'Engineering-Physical Problems of New Technics,' Moscow, May 19–22, 1998* [in Russian], Moscow State Technical University, Moscow (1998), pp. 154–155.
246. M. V. Shamolin, ”Some problems of spatial dynamics of a rigid body interacting with a medium under quasi-stationarity conditions,” In: *Abstracts of Reports of All-Russian Scientific-Technical Conference of Young Scientists 'Modern Problems of Aero-Cosmous Science,' Zhukovskii, May 27–29, 1998* [in Russian], Central Aero-Hydrodynamical Institute, Moscow (1998), pp. 89–90.
247. M. V. Shamolin, ”Absolute and relative structural stability in spatial dynamics of a rigid body interacting with a medium,” In: *Proceedings of International Conference 'Mathematics in Industry', ICIM-98, Taganrog, June 29- July 03, 1998* [in Russian], Taganrog State Pedagogical Institute, Taganrog (1998), pp. 332–333.
248. M. V. Shamolin, ”On integrability in transcendental functions,” *Usp. Mat. Nauk*, **53**, No. 3, 209–210 (1998). MR1657632 (99h:34006)
249. M. V. Shamolin, ”Families of three-dimensional phase portraits in spatial dynamics of a rigid body interacting with a medium,” In: *III International Symposium in Classical and Celestial Mechanics, August 23–27, 1998, Velikie Luki. Abstracts of Reports* [in Russian], Computational Center of Russian Academy of Sciences, Moscow-Velikie Luki (1998), pp. 165–167.
250. M. V. Shamolin, ”Methods of nonlinear analysis in dynamics of a rigid body interacting with a medium,” In: *CD-Proceedings of the Congress 'Nonlinear Analysis and Its Applications', Moscow, Russia, Sept. 1–5, 1998* [in Russian], Moscow (1999), pp. 497–508.
251. M. V. Shamolin, ”Family of portraits with limit cycles in plane dynamics of a rigid body interacting with a medium,” *Izv. Ross. Akad. Nauk, Mekhanika Tverdogo Tela*, **6**, 29–37 (1998).
252. M. V. Shamolin, ”Certain classes of partial solutions in dynamics of a rigid body interacting with a medium,” *Izv. Ross. Akad. Nauk, Mekhanika Tverdogo Tela*, **2**, 178–189 (1999).
253. M. V. Shamolin, ”New Jacobi integrable cases in dynamics of a rigid body interacting with a medium,” *Dokl. Ross. Akad. Nauk*, **364**, No. 5, 627–629 (1999). MR1702618 (2000k:70008)
254. M. V. Shamolin, ”On roughness of dissipative systems and relative roughness and non-roughness of variable dissipation systems,” *Usp. Mat. Nauk*, **54**, No. 5, 181–182 (1999). MR1741681 (2000j:37021)
255. M. V. Shamolin, ”A new family of phase portraits in spatial dynamics of a rigid body interacting with a medium,” *Dokl. Ross. Akad. Nauk*, **371**, No. 4, 480–483 (2000). MR1776307 (2001k:70006)
256. M. V. Shamolin, ”On roughness of disspative systems and relative roughness of variable dissipation systems,” In: *Abstracts of Reports of Workshop in Vector and Tensor Analysis Named*

after P. K. Rashevskii, Vestn. MGU, Ser. 1, Mat., Mekh., **2**, 63 (2000).
257. M. V. Shamolin, "On limit sets of differential equations near singular points," *Usp. Mat. Nauk*, **55**, No. 3, 187–188 (2000). MR1777365 (2002d:34049)
258. M. V. Shamolin, "Jacobi integrability in problem of four-dimensional rigid body motion in a resisting medium," *Dokl. Ross. Akad. Nauk*, **375**, No. 3, 343–346. (2000). MR1833828 (2002c:70005)
259. M. V. Shamolin, "On stability of motion of a body twisted around its longitudinal axis in a resisting medium," *Izv. Ross. Akad. Nauk, Mekhanika Tverdogo Tela* **1**, 189–193 (2001).
260. M. V. Shamolin, "Complete integrability of equations for motion of a spatial pendulum in overrunning medium flow," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **5**, 22–28 (2001). MR1868040 (2002f:70005)
261. M. V. Shamolin, "Problem of four-dimensional body motion in a resisting medium and a certain case of integrability," In: *Book of Abstracts of the Third International Conference "Differential Equations and Applications," St. Petersburg, Russia, June 12–17, 2000* [in Russian], St. Petersburg State University, St. Petersburg (2000), p. 198.
262. M. V. Shamolin, "On limit sets of differential equations near singular points,", *Usp. Mat. Nauk*, **55**, No. 3, 187–188 (2000). MR1777365 (2002d:34049)
263. M. V. Shamolin, "Many-dimensional topographical Poincaré systems and transcendental integrability," In: *IV Siberian Congress in Applied and Industrial Mathematics, Novosibirsk, June 26-July 01, 2000. Abstracts of Reports, Pt. I.* [in Russian], Novosibirsk, Institute of Mathematics (2000), pp. 25–26.
264. M. V. Shamolin, "Jacobi integrability of problem of four-dimensional body motion in a resisting medium," In: *Abstracts of Reports of International Conference in Differential Equations and Dynamical Systems, Suzdal', August 21–26, 2000* [in Russian], Vladimir, Vladimir State University (2000), pp. 196–197.
265. M. V. Shamolin, "Comparison of certain integrability cases from two-, three-, and four-dimensional dynamics of a rigid body interacting with a medium," In: *Abstracts of Reports of V Crimeanian International Mathematical School 'Lyapunov Function Method and Its Application,' (LFM-2000), Crimea, Alushta, September 5–13, 2000* [in Russian], Simpheropol' (2000), p. 169.
266. M. V. Shamolin, "On a certain case of Jacobi integrability in dynamics of a four-dimensional rigid body interacting with a medium," In: *Abstracts of Reports of International Conference in Differential and Integral Equations, Odessa, September 12–14, 2000* [in Russian], AstroPrint, Odessa (2000), pp. 294–295.
267. M. V. Shamolin, "On stability of motion of a rigid body twisted around its longitudinal axis in a resisting medium," *Izv. Ross. Akad. Nauk, Mekhanika Tverdogo Tela,* **1**, 189–193 (2001).
268. M. V. Shamolin, "Variety of types of phase portraits in dynamics of a rigid body interacting with a medium," In: *Abstracts of Sessions of Workshop 'Actual Problems of Geometry and Mechanics,' Fund. Prikl. Mat.*, **7**, No. 1, 302–303 (2001).
269. M. V. Shamolin, "Integrability of a problem of four-dimensional rigid body in a resisting medium," In: *Abstracts of Sessions of Workshop 'Actual Problems of Geometry and Mechanics,' Fund. Prikl. Mat.*, **7**, No. 1, 309 (2001).

270. M. V. Shamolin, ”New integrable cases in dynamics of a four-dimensional rigid body interacting with a medium,” In: *Abstracts of Reports of Scientific Conference, May 22–25, 2001* [in Russian], Kiev (2001), p. 344.
271. M. V. Shamolin, ”Integrability cases of equations for spatial dynamics of a rigid body,” *Prikl. Mekh.*, **37**, No. 6, 74–82 (2001). MR1872149 (2002i:70006)
272. M. V. Shamolin, ”New Jacobi integrable cases in dynamics of two-, three-, and four-dimensional rigid body interacting with a medium,” In: *Absracts of Reports of VIII All-Russian Congress in Theoretical and Applied Mechanics, Perm’, August 23–29, 2001* [in Russian], Ural Department of Russian Academy of Sciencesm Ekaterinburg (2001), pp. 599–600.
273. M. V. Shamolin, ”On integrability of certain classes of nonconservative systems,” *Usp. Mat. Nauk*, **57**, No. 1, 169–170 (2002). MR1914556 (2003g:34019)
274. M. V. Shamolin, ”New integrable cases in dynamics of a two-, three-, and four-dimensional rigid body interacting with a medium,” In: *Abstracts of Reports of International Conference in Differential Equations and Dynamical Systems, Suzdal’, July 1–6, 2002* [in Russian], Vladimir State University, Vladimir (2002), pp. 142–144.
275. M. V. Shamolin, ”On a certain spatial problem of rigid body motion in a resisting medium,” In: *Abstracts of Reports of International Scientific Conference ‘Third Polyakhov Readings,’ St. Petersburg, February 4–6, 2003* [in Russian], NIIKh St. Petersburg Univ, (2003), pp. 170–171.
276. M. V. Shamolin, ”Integrability in transcendental functions in rigid body dynamics,” In: *Abstracts of Reports of Scientific Conference ‘Lomonosov Readings,’ Sec. Mechanics, April 17–27, 2003, Moscow, M. V. Lomonosov Moscow State University* [in Russian], MGU, Moscow (2003), p. 130.
277. M. V. Shamolin, ”On integrability of nonconservative dynamical systems in transcendental functions,” In: *Modelling and Study of Stability of Systems, Scientific Conference, May 27–30, 2003, Abstracts of Reports* [in Russian], Kiev (2003), p. 277.
278. M. V. Shamolin, ”Geometric representation of motion in a certain problem of body interaction with a medium,” *Prikl. Mekh.*, **40**, No. 4, 137–144 (2004). MR2131714 (2005m:70050)
279. M. V. Shamolin, ”Integrability of nonconservative systems in elementary functions,” In: *X Mathematical International Conference Named after Academician M. Kravchuk, September 3–15, 2004, Kiev* [in Russian], Kiev (2004), p. 279.
280. M. V. Shamolin, *Methods for Analysis of Classes of Nonconservative Systems in Dynamics of a Rigid Body Interacting with a Medium* [in Russian], Doctorial Dissertation, MGU, Moscow (2004), p. 329.
281. M. V. Shamolin, *Some Problems of Differential and Topological Diagnostics* [in Russian], Ekzamen, Moscow (2004).
282. M. V. Shamolin, ”On rigid body motion in a resisting medium taking account of rotational derivatives of areodynamic force moment in angular velocity,” In: *Modelling and Studying of Systems, Scientific Conference, May 23–25, 2005. Abstracts of Reports* [in Russian], Kiev (2005), p. 351.
283. M. V. Shamolin, ”Cases of complete integrability in dynamics of a four-dimensional rigid body interacting with a medium,” In: *Abstracts of Reports of International Conference ‘Functional Spaces, Approximation Theory, and Nonlinear Analysis’ Devoted to the 100th Anniversary of*

A. M. Nikol'skii, Moscow, May 23–29, 2005 [in Russian], V. A. Steklov Mathematical Institute of Russian Academy of Sciences, Moscow (2005), p. 244.

284. M. V. Shamolin, "On a certain integrable case in dynamics on $so(4) \times \mathbb{R}^4$," In: *Abstracts of Reports of All-Russian Conference 'Differential Equations and Their Applications,' (SamDif-2005), Samara, June 27-Jily 2, 2005* [in Russian], Univers-Grupp, Samara (2005), pp. 97–98.
285. M. V. Shamolin, "A case of complete integrability in spatial dynamics of a rigid body interacting with a medium taking account of rotational derivatives of force moment in angular velocity," *Dokl. Ross. Akad. Nauk*, **403**, No. 4, 482–485 (2005). MR2216035 (2006m:70012)
286. M. V. Shamolin, "Comparison of Jacobi integrable cases of plane and spatial body motions in a medium under streamline flow around," *Prikl. Mat. Mekh.*, **69**, No. 6, 1003–1010 (2005). MR2252203 (2007c:70009)
287. M. V. Shamolin, "On body motion in a resisting medium taking account of rotational derivatives of aerodynamic force moment in angular velocity," In: *Abstracts of Reports of Scientific Conference 'Lomonosov Readings-2005,' Sec. Mechanics, April, 2005, Moscow, M. V. Lomonosov Moscow State University* [in Russian], MGU, Moscow (2005), p. 182.
288. M. V. Shamolin, "Variable dissipation dynamical systems in dynamics of a rigid body interacting with a medium," In: *Differential Equations and Computer Algebra Tools, Materials of International Conference, Brest, October 5–8, 2005, Pt. 1*. [in Russian], BGPU, Minsk (2005), pp. 231–233.
289. M. V. Shamolin, "On a certain integrable case of equations of dynamics in $so(4) \times \mathbb{R}^n$," *Usp. Mat. Nauk*, **60**, No. 6, 233–234 (2005). MR2225204 (2007a:70009)
290. M. V. Shamolin, "Integrability in transcendental functions in rigid body dynamics," In: *Mathematical Conference 'Modern Problems of Applied Mathematics and Mathematical Modelling, Voronezh, December 12–17, 2005* [in Russian], Voronezh State Academy, Voronezh (2005), p. 240.
291. M. V. Shamolin, "Variable dissipation systems in dynamics of a rigid body interacting with a medium," In: *Fourth Polyakhov Readings, Abstracts of Reports of International Scientific Conference on Mechanics, St. Petersburg, February 7–10, 2006* [in Russian], VVM, St. Petersburg (2006), p. 86.
292. M. V. Shamolin, "Model problem of body motion in a resisting medium taking account of dependence of resistance force on angular velocity," In: *Scientifuc Report of Institute of Mechanics, Moscow State University* [in Russian], No. 4818, Institute of Mechanics, Moscow State University, Moscow (2006), p. 44.
293. M. V. Shamolin, "To problem on rigid body spatial drag in a resisting medium," *Izv. Ross. Akad. Nauk, Mekhanika Tverdogo Tela*, **3**, 45–57 (2006).
294. M. V. Shamolin, "On trajectories of characteristic points of a rigid body moving in a medium," In: *International Conference 'Fifth Okunev Readings,' St. Petersburg, June 26–30, 2006. Absracts of Reports* [in Russian], Baltic State Technical University, St. Petersburg (2006), p. 34.
295. M. V. Shamolin, "On a case of complete integrability in four-dimensional rigid body dynamics," In: *Abstracts of Reports of International Conference in Differential Equations and Dynamical Systems, Vladimir, July 10–15, 2006* [in Russian], Vladimir State University, Vladimir (2006),

pp. 226–228.
296. M. V. Shamolin, ”To spatial problem of rigid body interaction with a resisting medium,” In: *Absracts of Reports of IX All-Russian Congress in Theoretical and Applied Mechanics, Nizhnii Novgorod, August 22–28, 2006. Vol. I* [in Russian], N. I. Lobachevskii Nizhnii Novgorod State Univesity, Nizhnii Novgorod (2006), p. 120.
297. M. V. Shamolin, ”Spatial problem on rigid body motion in a resisting medium,” In: *VIII Crimeanian International Mathematical School ‘Lyapunov Function Method and Its Applications,’ Abstracts of Reports, Alushta, September 10–17, 2006, Tavriya National University* [in Russian], DiAiPi, Simpheropol’ (2006), p. 184.
298. M. V. Shamolin, ”Variety of types of phase portraits in dynamics of a rigid body interacting with a medium,” In: *Abstracts of Sessions of Workshop ‘Actual Problems of Geometry and Mechanics,’ Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 17.
299. M. V. Shamolin, ”Integrability of problem of four-dimensional rigid body motion in a resisting medium,” In: *Abstracts of Sessions of Workshop ‘Actual Problems of Geometry and Mechanics,’ Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 21.
300. M. V. Shamolin, ”On account of rotational deivatives of a aerodynamic force moment on body motion in a resisting medium,” In: *Abstracts of Sessions of Workshop ‘Actual Problems of Geometry and Mechanics,’ Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 26.
301. M. V. Shamolin, ”New integrable cases in dynamics of a four-dimensional rigid body interacting with a medium,” In: *Abstracts of Sessions of Workshop ‘Actual Problems of Geometry and Mechanics,’ Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 27.
302. M. V. Shamolin, ”On integrability in transcendental functions,” In: *Abstracts of Sessions of Workshop ‘Actual Problems of Geometry and Mechanics,’ Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 34.
303. M. V. Shamolin, ”On integrability of motion of four-dimensional body-pendulum situated in over-running medium flow,” In: *Abstracts of Sessions of Workshop ‘Actual Problems of Geometry and Mechanics,’ Contemporary Mathematics, Fundamental Directions* [in Russian] Vol. 23, (2007), p. 37.
304. M. V. Shamolin, ”Integrability in elementary functions of variable dissipation systems,” In: *Abstracts of Sessions of Workshop ‘Actual Problems of Geometry and Mechanics,’ Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 38.
305. M. V. Shamolin, ”Integrability in transcendental elementary functions,” In: *Abstracts of Sessions of Workshop ‘Actual Problems of Geometry and Mechanics,’ Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 40.
306. M. V. Shamolin, ”On rigid body motion in a resisting medium taking account of rotational derivatives of aerodynamic force moment in angular velocity,” In: *Abstracts of Sessions of Workshop ‘Actual Problems of Geometry and Mechanics,’ Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 44.
307. M. V. Shamolin, ”Influence of rotational derivatives of medium interaction force moment in

angular velocity of a rigid body on its motion," In: *Abstracts of Sessions of Workshop 'Actual Problems of Geometry and Mechanics,' Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 44.

308. M. V. Shamolin, "On work of All-Russian Conference 'Differential equations and Their Applications,' Samara, June 27-July 29, 2005," In: *Abstracts of Sessions of Workshop 'Actual Problems of Geometry and Mechanics,' Contemporary Mathematics, Fundamental Directions* [in Russian], Vol. 23 (2007), p. 45.
309. M. V. Shamolin, "On integrability in elementary functions of certain classes of nonconservative dynamical systems," In: *Modelling and Study of Stability of Systems, Scientific Conference, May 22–25, 2007. Abstracts of Reports* [in Russian], Kiev (2007), p. 249.
310. M. V. Shamolin, "Case of complete integrability in dynamics of a four-dimensional rigid body in nonconcervative force field," In: *'Nonlinear Dynamical Analysis-2007,' Abstracts of Reports of International Congress, St. Petersburg, June 4–8, 2007* [in Russian], St. Petersburg State University, St. Petersburg (2007), p. 178.
311. M. V. Shamolin, "Cases of complete integrability in elementary functions of certain classes of nonconservative dynamical systems," In: *Abstracts of Reports of International Conference 'Classical Problems of Rigid Body Dynamics,' June 9–13, 2007* [in Russian], Institute of Applied Mathematics and Mechanics, National Academy of Sciences of Ukraine, Donetsk (2007), pp. 81–82.
312. M. V. Shamolin, "Complete integrability of equations of motion for a spatial pendulum in medium flow taking account of rotational derivatives of moment of its action force," *Izv. Ross Akad. Nauk, Mekhanika Tverdogo Tela*, **3**, 187–192 (2007).
313. M. V. Shamolin, "Cases of complete integrability in dynamics of a four-dimensional rigid body in a nonconservative force field," In: *Abstracts of Reports of International Conference 'Analysis and Singularities,' Devoted to 70th Anniversary of V. I. Arnol'd, August 20–24, 2007, Moscow* [in Russian], MIAN, Moscow (2007), pp. 110–112.
314. M. V. Shamolin, "A case of complete integrability in dynamics on a tangent bundle of two-dimensional sphere," *Usp. Mat. Nauk*, **62**, No. 5, 169–170 (2007). MR2373767 (2008i:37121)
315. M. V. Shamolin, "Cases of complete integrability in dynamics of a rigid body interacting with a medium," In: *Abstracts of Reports of All-Russiann Conference 'Modern Problems of Continuous Medium Mechanics' Devoted to Memory of L. I. Sedov in Connection with His 100th Anniversary, Moscow, November, 12–14, 2007* [in Russian], MIAN, Moscow (2007), pp. 166–167.
316. M. V. Shamolin, "On stability of a certain regime of rigid body motion in a resisting medium," In: *Abstracts of Reports of Scientific Conference 'Lomonosov Readings-2007,' Sec. Mechanics, Moscow, Moscow State University, April, 2007* [in Russian], MGU, Moscow (2007), p. 153.
317. M. V. Shamolin, *Methods for Analysis of Variable Dissipation Dynamical Systems in Rigid Body Dynamics* [in Russian], Ekzamen, Moscow (2007).
318. M. V. Shamolin, *Some Problems of Differential and Topological Diagnostics* [in Russian], 2nd Corrected and Added Edition, Eksamen, Moscow (2007).
319. M. V. Shamolin, "Three-parameter family of phase portraits in dynamics of a rigid body interacting with a medium," *Dokl. Ross. Akad. Nauk*, **418**, No. 1. 46–51 (2008). MR2459491

320. M. V. Shamolin and S. V. Tsyptsyn, ”Analytical and numerical study of trajectories of body motion in a resisting medium,” In: *Scientific Report of Institute of Mechanics, Moscow State University* [in Russian], No. 4289, Institute of Mechanics, Moscow State University, Moscow (1993).
321. M. V. Shamolin and D. V. Shebarshov, ”Projections of Lagrangian tori of a biharmonic oscillator on position space and dynamics of a rigid body interacting with a medium,” In: *Modelling and Study of Stability of Systems, Scientific Conference May 19–23, 1997. Abstracts of Reports* [in Russian], Kiev (1997), p. 142.
322. M. V. Shamolin, ”Structural stable vector fields in rigid body dynamics, In: *Proc. of 8th Conf. on Dynamical Systems (Theory and Applications) (DSTA 2005), Lodz, Poland, Dec. 12–15, 2005; Tech. Univ. Lodz.*, **1**, 429–436 (2005).
323. M. V. Shamolin, ”Global qualitative analysis of the nonlinear systems on the problem of a body motion in a resisting medium,” In: *Fourth Colloquium on the Qualitative Theory of Differential Equations, Bolyai Institute, August 18–21, 1993*, Szeged, Hungary (1993), p. 54.
324. M. V. Shamolin, ”Relative structural stability on the problem of a body motion in a resisting medium,” In: *ICM'94, Abstract of Short Communications, Zurich, 3–11 August, 1994*, Zurich, Switzerland (1994), p. 207.
325. M. V. Shamolin, ”Structural optimization of the controlled rigid motion in a resisting medium,” In: *WCSMO-1, Extended Abstracts. Posters, Goslar, May 28-June 2, 1995*, Goslar, Germany (1995), pp. 18–19. MR1809236
326. M. V. Shamolin, ”Qualitative methods to the dynamic model of an interaction of a rigid body with a resisting medium and new two-parametric families of the phase portraits,” In: *DynDays '95 (Sixteenth Annual Informal Workshop), Program and Abstracts, Lyon, June 28-July 1, 1995*, Lyon, France (1995), p. 185.
327. M. V. Shamolin, ”New two-parameter families of the phase patterns on the problem of a body motion in a resisting medium,” In: *ICIAM'95, Book of Abstracts, Hamburg, 3–7 July, 1995*, Hamburg, Germany (1995), p. 436.
328. M. V. Shamolin, ”Poisson-stable and dense orbits in rigid body dynamics,” In: *3rd Experimental Chaos Conference, Advance Program, Edinburg, Scotland, August 21–23, 1995*, Edinburg, Scotland (1995), p. 114.
329. M. V. Shamolin, ”Qualitative methods in interacting with the medium rigid body dynamics,” In: *Abstracts of GAMM Wissenschaftliche Jahrestangung'96, 27–31 May, 1996, Prague, Czech Rep*, Karls-Universitat Prag., Prague, (1996), pp. 129–130.
330. M. V. Shamolin, ”Relative structural stability and relative structural instability of different degrees in topological dynamics,” In: *Abstracts of International Topological Conference Dedicated to P. S. Alexandroff's 100th Birthday 'Topology and Applications,' Moscow, May 27–31, 1996* [in Russian], Phasys, Moscow (1996), pp. 207–208.
331. M. V. Shamolin, ”Topographical Poincare systems in many dimensional spaces,” In: *Fifth Colloquium on the Qualitative Theory of Differential Equations, Bolyai Institute, Regional Committee of the Hungarian Academy of Sciences, July 29-August 2, 1996*, Szeged, Hungary (1996), p. 45.
332. M. V. Shamolin, ”Qualitative methods in interacting with the medium rigid body dynamics,”

In: *Abstracts of XIXth ICTAM, Kyoto, Japan, August 25–31, 1996,* Kyoto, Japan (1996), p. 285.

333. M. V. Shamolin, "Three-dimensional structural optimization of controlled rigid motion in a resisting medium," In: *Proceedings of WCSMO-2, Zakopane, Poland, May 26–30, 1997, Zakopane*, Poland (1997), pp. 387–392.
334. M. V. Shamolin, "Classical problem of a three-dimensional motion of a pendulum in a jet flow," In: *3rd EUROMECH Solid Mechanics Conference, Book of Abstracts, Stockholm, Sweden, August 18–22, 1997*, Royal Inst. of Technology, Stockholm, Sweden (1997), p. 204.
335. M. V. Shamolin, "Families of three-dimensional phase portraits in dynamics of a rigid body," In: *EQUADIFF 9, Abstracts, Enlarged Abstracts, Brno, Czech Rep., August 25–29, 1997*, Masaryk Univ., Brno, Czech Rep. (1997), p. 76.
336. M. V. Shamolin, "Many-dimensional topographical Poincare systems in rigid body dynamics," In: *Abstracts of GAMM Wissenschaftliche Jahrestangung'98, 6–9 April, 1998, Bremen, Germany*, Universitat Bremen, Bremen (1998), p. 128.
337. M. V. Shamolin, Shebarshov D. V. Lagrange tori and equation of Hamilton-Jacobi," In: *Book of Abstracts of Conference PDE Prague'98 (Praha, August 10–16, 1998; Partial Differential Equations: Theory and Numerical Solutions)*, Charles University, Praha, Czech Rep. (1998), p. 88.
338. M. V. Shamolin, "New two-parameter families of the phase portraits in three-dimensional rigid body dynamics," In: *Abstracts of International Conference Dedicated to L. S. Pontryagin's 90th Birthday 'Differential Equations,' Moscow, 31.08.-6.09, 1998* [in Russian], MGU, Moscow (1998), pp. 97–99.
339. M. V. Shamolin, "Lyapunov functions method and many-dimensional topographical systems of Poincare in rigid body dynamics," In: *Abstracts of Reports of IV Crimeanian International Mathematical School 'Lyapunov Function Method and Its Application,' (LFM-1998), Crimea, Alushta, September 5–12, 1998* [in Russian], Simpheropol' (1998), p. 80.
340. M. V. Shamolin, "Some classical problems in a three-dimensional dynamics of a rigid body interacting with a medium," In: *Proc. of ICTACEM'98, Kharagpur, India, Dec. 1–5, 1998*, Aerospace Engineering Dep., Indian Inst. of Technology, Kharagpur, India (1998), p. 11 (CD-Rome, Printed at: Printek Point, Technology Market, KGP-2).
341. M. V. Shamolin, "Integrability in terms of transcendental functions in rigid body dynamics," In: *Book of Abstr. of GAMM Annual Meeting, April 12–16, 1999*, Universite de Metz, Metz, France (1999), p. 144.
342. M. V. Shamolin, "Mathematical modelling of interaction of a rigid body with a medium and new cases of integrability," In: *CD-Proc. of ECCOMAS 2000, Barcelona, Spane, September 11–14, 2000*, Barcelona (2000), p. 11.
343. M. V. Shamolin, "Methods of analysis of dynamics of a rigid body interacting with a medium," In: *Book of Abstr. of Annual Scient. Conf. GAMM 2000 at the Univ. of Gottingen, April 2–7, 2000*, Univ. of Gottingen, Gottingen (2000), p. 144.
344. M. V. Shamolin, "Integrability and nonintegrability in terms of transcendental functions," In: *CD-Abs. of 3rd ECM (Poster sessions), Barcelona, Spain, June 10–14, 2000 (poster No. 36, without pages)*, Barcelona (2000).

345. M. V. Shamolin, ”About interaction of a rigid body with a resisting medium under an assumption of a jet flow,” In: *Book of Abstr. II (General sessions) of 4th EUROMECH Solid Mech. Conf., Metz, France (June 26–30, 2000)*, Universite de Metz, Metz, France (2000), p. 703.
346. M. V. Shamolin, ”New families of many-dimensional phase portraits in dynamics of a rigid body interacting with a medium,” In: *CD-Proc. of 16th IMACS World Cong. 2000, Lausanne, Switzerland, August 21–25*, EPFL (2000), p. 3.
347. M. V. Shamolin, ”Comparison of some cases of integrability in dynamics of a rigid body interacting with a medium,” In: *Book of Abstr. of Annual Scient. Conf. GAMM 2001, ETH Zurich, February 12–15, 2001*, ETH Zurich (2001), p. 132.
348. M. V. Shamolin, ”Pattern recognition in the model of the interaction of a rigid body with a resisting medium,” In: *Col. of Abstr. of First SIAM-EMS Conf. ‘Applied Mathematics in Our Changing World,’ Berlin, Germany, Sept. 2–6, 2001*, Springer, Birkhauser (2001), p. 66.
349. M. V. Shamolin, ”Some questions of the qualitative theory of ordinary differential equations and dynamics of a rigid body interacting with a medium,” *J. Math. Sci.*, **110**, No. 2, 2526–2555 (2002). MR1919087 (2004j:37161)
350. M. V. Shamolin, ”Dynamical systems with the variable dissipation in 3D-dynamics of a rigid body interacting with a medium,” In: *Book of Abstr. of 4th ENOC, Moscow, Russia, August 19–23, 2002* [in Russian], Inst. Probl. Mech. Russ. Acad. Sci., Moscow (2002), p. 109.
351. M. V. Shamolin, ”Methods of analysis of dynamics of a 2D-, 3D-, or 4D-rigid body with a medium,” In: *Abst. Short Commun. Post. Sess. of ICM’2002, Beijing, 2002, August 20–28*, Higher Education Press, Beijing, China (2002), p. 268.
352. M. V. Shamolin, ”New integrable cases and families of portraits in the plane and spatial dynamics of a rigid body interacting with a medium,” *J. Math. Sci.*, **114**, No. 1, 919–975 (2003). MR1965083 (2004d:70008)
353. M. V. Shamolin, ”Integrability and nonintegrability in terms of transcendental functions,” In: *Book of Abstr. of Annual Scient. Conf. GAMM 2003, Abano TermePadua, Italy, March 24–28, 2003*, Univ. of Padua, Italy (2003), p. 77.
354. M. V. Shamolin, ”Global structural stability in dynamics of a rigid body interacting with a medium,” In: *5th ICIAM, Sydney, Australia, July 7–11, 2003*, Univ. of Technology, Sydney (2003), p. 306.
355. M. V. Shamolin, ”Classes of variable dissipation systems with nonzero mean in the dynamics of a rigid body,” *J. Math. Sci.*, **122**, No. 1, 2841–2915 (2004). MR2082898 (2005j:70014)
356. M. V. Shamolin, ”Some cases of integrability in dynamics of a rigid body interacting with a resisting medium,” In: *Abstracts of Reports of International Conference in Differential Equations and Dynamical Systems, Suzdal’, July 05–10, 2004* [in Russian], Vladimir, Vladimir State University (2004), pp. 296–298.
357. M. V. Shamolin, ”Mathematical model of interaction of a rigid body with a resisting medium in a jet flow,” In: *Abstr. Part 1, 76 Annual Sci. Conf. (GAMM), Luxembourg, March 28-April 1, 2005*, Univ. du Luxembourg, Luxembourg (2005) pp. 94–95.
358. M. V. Shamolin, ”Some cases of integrability in 3D dynamics of a rigid body interacting with a medium,” In: *Book of Abstr. IMA Int. Conf. ‘Recent Advances in Nonlinear Mechanics,’ Aberdeen, Scotland, August 30-September 1, 2005*, IMA, Aberdeen (2005), p. 112.

359. M. V. Shamolin, "Almost conservative systems in dynamics of a rigid body," In: *Book of Abstr., 77th Annual Meeting of GAMM, March 27–31, 2006, Technische Univ. Berlin*, Technische Univ., Berlin (2006), p. 74.
360. M. V. Shamolin, "4D-rigid body and some cases of integrability," In: *Abstracts of ICIAM07, Zurich, Switzerland, June 16–20, 2007*, ETH Zurich (2007), p. 311.
361. M. V. Shamolin, "The cases of complete integrability in dynamics of a rigid body interacting with a medium," In: *Book of Abstr. of Int. Conf. on the Occasion of the 150th Birthday of A. M. Lyapunov (June 24–30, 2007, Kharkiv, Ukraine)* [in Russian], Verkin Inst. Low Temper. Physics Engineer. NASU, Kharkiv (2007), pp. 147–148.
362. M. V. Shamolin, "On the problem of a symmetric body motion in a resisting medium," In: *Book of Abst. of EMAC-2007 (July 1–4, 2007, Hobart, Australia)*, Univ. Tasmania, Hobart, Australia (2007), p. 25.
363. M. V. Shamolin, "The cases of integrability in 2D-, 3D-, and 4D-rigid body dynamics," In: *Abstr. of Short Commun. and Post, of Int. Conf. 'Dynamical Methods and Mathematical Modelling,' Valladolid, Spane (Sept. 18–22, 2007)*, ETSII, Valladolid (2007), p. 31.
364. M. V. Shamolin, "The cases of integrability in terms of transcendental functions in dynamics of a rigid body interacting with a medium," In: *Proc. of 9th Conf. on Dynamical Systems (Theory and Applications) (DSTA 2007), Lodz, Poland, Dec. 17–20, 2007*, Vol. 1, Tech. Univ. Lodz (2007), pp. 415–422.
365. O. P. Shorygin and N. A. Shul'man, "Entrance of a disk to water with angle of arttack," *Uch. Zap. TsAGI*, **8**, No. 1, 12–21 (1978).
366. J. L. Singh, *Classical Dynamics* [Russian translation], Fizmatgiz, Moscow (1963).
367. S. Smale, "Rough systems are not dense," In: *A Collection of Translations. Mathematics* [in Russian], **11**, No. 4, 107–112 (1967).
368. S. Smale, "Differentiable dynamical systems," *Usp. Mat. Nauk*, **25**, No. 1, 113–185 (1970). MR0263116 (41 #7721)
369. V. M. Starzhinskii, *Applied Methods of Nonlinear Oscillations* [in Russian], Nauka, Moscow (1977). MR0495355 (58 #14067)
370. V. A. Steklov, *On Rigid Body Motion in a Fluid* [in Russian], Khar'kov (1893).
371. V. V. Stepanov, *A Course of Differential Equations* [in Russian], Fizmatgiz, Moscow (1959).
372. E. I. Suvorova and M. V. Shamolin, "Poincaré topographical systems and comparison systems of higher orders," In: *Mathematical Conference 'Modern Methods of Function Theory and Related Problems,' Voronezh, January 26-February 2, 2003* [in Russian], Voronezh State University, Voronezh (2003), pp. 251–252.
373. G. K. Suslov, *Theoretical Mechanics* [in Russian], Gostekhizdat, Moscow (1946).
374. V. V. Sychev, A. I. Ruban, and G. L. Korolev, *Asymptotic Theory of Separation Flows* [In Russian], Nauka, Moscow (1987).
375. V. G. Tabachnikov, "Stationary characteristics of wings in small velocities under whole range of angles of attack," In: *Proceedings of Central Aero-Hydrodynamical Institute* [in Russian], Issue 1621, Moscow (1974), pp. 18–24.
376. Ya. V. Tatarinov, *Lectures on Classical Dynamics* [in Russian], MGU, Moscow (1984).
377. V. V. Trofimov, "Embeddings of finite groups in compact Lie groups by regular elements,"

Dokl. Akad. Nauk SSSR, **226**, No. 4, 785–786 (1976). MR0439984 (55 #12865)
378. V. V. Trofimov, "Euler equations on finite-dimensional solvable Lie groups," *Izv. Akad. Nauk SSSR, Ser. Mat.*, **44**, No. 5, 1191–1199 (1980). MR0595263 (82e:70006)
379. V. V. Trofimov, "Symplectic structures on automorphism groups of symmetric spaces," *Vestn. MGU, Ser. 1, Mat., Mekh.*, **6**, 31–33 (1984). MR0775300 (86b:53038)
380. V. V. Trofimov, "Geometric invariants of completely integrable systems," In: *Abstract of Reports of All-Union Conference in Geometry in the 'Large,'* Novosibirsk (1987), p. 121.
381. V. V. Trofimov and A. T. Fomenko, " A methodology for constructing Hamiltonian flows on symmetric spaces and integrability of certain hydrodynamic systems," *Dokl. Akad. Nauk SSSR*, **254**, No. 6, 1349–1353 (1980). MR0592507 (82b:58038)
382. V. V. Trofimov and M. V. Shamolin, "Dissipative systems with nontrivial generalized Arnol'd-Maslov classes," In: *Abstracts of Reports of Workshop in Vector and Tensor Analysis Named after P. K. Rashevskii, Vestn. MGU, Ser. 1, Mat., Mekh.* **2**, 62 (2000).
383. Ch. J. De La Vallee Poussin, *Lectures on Theoretical Mechanics*, Vols. I, II [Russian translation], IL, Moscow (1948–1949).
384. S. V. Vishik and S. F. Dolzhanskii, "Analogs of Euler-Poisson equations and magnetic electrodynamic related to Lie groups," *Dokl. Akad. Nauk SSSR*, **238**, No. 5, 1032–1035.
385. I. N. Vrublevskaya, "On geometric equivalence of trajectories and semitrajectories of dynamical systems," *Mat. Sb.*, **42** (1947).
386. I. N. Vrublevskaya, "Some criteria of equivalence of trajectories and semitrajectories of dynamical systems," *Dokl. Akad. Nauk SSSR*, **97**, No. 2 (1954). MR0067480 (16,734i)
387. C.-L. Weyher, *Observations sur le Vol Plane Par Obres*, "L'Aeronaute" (1890).
388. E. T. Whittecker, *Analytical Dynamics* [Russian translation], ONTI, Moscow (1937).
389. M. V. Yakobson, "On self-mappings of a circle," *Mat. Sb.*, **85**, 183–188 (1975).
390. N. E. Zhukovskii, "On a fall of light oblong bodies rotating around their longitudinal axis," In: *A Complete Collection of Works* [in Russian], Vol. 5, Fizmatgiz, Moscow (1937), pp. 72–80, 100–115.
391. N. E.. Zhukovskii, "On bird soaring," In: *A Complete Collection of Works* [in Russian] Vol. 5, Fizmatgiz, Moscow (1937), pp. 49–59.
392. V. F. Zhuravlev and D. M. Klimov, *Applied Methods in Oscillation Theory* [in Russian], Nauka, Moscow (1988). MR0987633 (90g:70001)
393. Yu. F. Zhuravlev, "Submergence of a disk into a fluid at an angle to a free surface," In: *A Collection of Works in Hydrodynamics* [in Russian], Central Aero-Hydrodynamical Institute, Moscow (1959), pp. 164–167.

Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

MR2676327 (2011i:16057) 16T25 (16W50)
Aĭdagulov, R. R. (RS-MOSC); **Shamolin, M. V.** (RS-MOSC)

Color groups. (Russian. Russian summary)

Sovrem. Mat. Prilozh. No. 62, Geometriya i Mekhanika (2009), 14–26; *translation in J. Math. Sci. (N. Y.)* **161** (2009), *no. 5*, 615–627.

In this investigative review the authors aim to define groups of colors, elaborating on what kind of groups can belong to such color groups and how they should differ from the graded subgroups. Much emphasis is placed on the Yang-Baxter symmetry, which has been shown to play a crucial role in describing the notion of a true color group. The central concept is explained in a systematic way through several definitions, statements and their proofs. The notion of the color group is shown to be related to the grading over the algebra, which in turn is linked also to the symmetry and the solution of the Yang-Baxter relation. The subtle difference between the grading of a group and a colored group is explained by introducing the notion of *bicharacter*. It is emphasized through several steps that, to every grading element g, a color can be assigned constituting a set of equivalent g-grading with the bicharacter depending only on the color group and not on the empty part of the grading. As an illuminating example, the well-known Clifford algebra is shown to be a color algebra of a color group.

Reviewed by *Anjan Kundu*

References

1. L. N. Balaba and S. A. Pikhtil'kov, "Primary radical of special Lie superalgebras," *Fundam. Prikl. Mat.*, **9**, No. 1, 51–60 (2003).
2. Kh. Bass, *Algebraic K-Theory* [Russian translation], Mir, Moscow (1973). MR0346032 (49 #10758)
3. I. Bukur and A. Delyanu, *Introduction to the Theory of Categories and Functors* [Russian translation], Mir, Moscow (1972). MR0349790 (50 #2283)
4. Ch. Curtis and I. Rayner, *The Representation Theory of Finite Groups and Associative Algebras* [Russian translation] (S. D. Berman (Ed.)), Nauka, Moscow (1969). MR0248238 (40 #1490)
5. E. E. Demidov, *Quantum Groups* [in Russian], Faktorial, Moscow (1998).
6. V. G. Drinfel'd, "Hopf algebras and the quantum Young-Baxter equation," *Dokl. Akad. Nauk SSSR*, **283**, No. 5, 1060–1064 (1985). MR0802128 (87h:58080)
7. V. G. Drinfel'd, "Quantum groups," *Zap. Nauch. Semin LOMI*, **155**, 19–49 (1986).
8. K. Feis, *Algebra: Rings, Modules, and Categories* [in Russian] (L. A. Skornyakov (Ed.)), Vol. I, Mir, Moscow (1977). MR0491784 (58 #10983)
9. A. T. Fomenko, *Symplectic Geometry: Methods and Applications* [in Russian], MGU, Moscow (1988). MR0964470 (90k:58082)
10. *General Algebra* [in Russian] (L. A. Skornyakov (Ed.)), Vols. 1–2, Nauka, Moscow (1990).

MR1137273 (93a:00001a)
11. M. V. Gross, D. Huybrechts, D. Joice, ”Calabi-Yau manifolds and related geometries,” In: *Lectures at a Summer School in Nordfjordeid*, Norway, June 2001, Berlin etc.: Springer, Cop., VIII (2003), pp. 299. MR1963562
12. D. Huesmuller, *Stratified Spaces* [Russian translation], Mir, Moscow (1970).
13. K. Kassel, *Quantum Groups* [Russian translation], Fazis, Moscow (1999).
14. B. A. Kupershmidt, ”KP or mKP: non-commutative mathematics of Lagrangian, Hamiltonian, and integrable systems,” In: *Moscow-Izhevsk, Reg. Chaot. Dynam.* [Russian translation], Moscow-Izhevsk (2002), pp. 1–612. MR1752088 (2001d:37113)
15. S. MacLane, *Categories for Working Mathematician* [Russian translation], Fizmatlit, Moscow (2004).
16. A. A. Mikhalev, ”Subalgebras of free colored Lie Superalgebras,” *Mat. Zametki*, **37**, No. 5, 653–659 (1985). MR0797705 (87a:17023)
17. V. Nazaikinskii, B. Sternin, and V. Shatalov, *Methods of Non-commutative Analysis* [in Russian], Tekhnosfera, Moscow (2002).
18. S. P. Novikov and I. A. Taimanov, *Modern Geometric Structures and Fields* [in Russian], MTsNMO, Moscow (2005). MR2264644 (2007i:53001)
19. Roger Penrose, ”A way to the reality or laws ruling over the universe,” In: *Moscow-Izhevsk, Reg. and Chaot. Dynam.* [Russian translation], Moscow-Izhevsk (2007).
20. A. Poincaré, *On Curves Defined by Differential Equations* [Russian translation], Gostekhizdat, Moscow-Leningrad (1947).
21. A. Poincaré, *New Methods in Celestial Mechanics* [Russian translation], Selected Works, Vol. 1. Nauka, Moscow (1971); Vol. 2. Nauka, Moscow (1972).
22. M. Sh. Tsalenko and E. G. Schulgeifer, *Basics of the Theory of Categories* [in Russian], Nauka, Moscow (1974).
23. I. R. Shafarevich, *Basic Notions of Algebra* [in Russian], Izhevsk (2001).
24. M. V. Shamolin, ”New integrable cases and families of portraits in the plane and spatial dynamics of a rigid body interacting with a medium,” *J. Math. Sci.*, **114**, No. 1, 919–975 (2003). MR1965083 (2004d:70008)
25. M. V. Shamolin, ”Classes of variable dissipation systems with nonzero mean in the dynamics of a rigid body,” *J. Math. Sci.*, **122**, No. 1, 2841–2915 (2004). MR2082898 (2005j:70014)
26. Yu. Vladimirov, *Geometrophysics* [in Russian], Binom, Moscow (2005).

Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

MR2541122 (2010k:70007) 70E15 (70H06)

Shamolin, M. V. (RS-MOSC-IMC)

New cases of complete integrability in the dynamics of a dynamically symmetric four-dimensional rigid body in a nonconservative field. (Russian)

Dokl. Akad. Nauk **425** (2009), *no. 3,* 338–342.

Two conditional integrable cases are constructed in the dynamics of a 4-dimensional axisymmetric rigid body moving under the action of a resistance-like follower-force applied to a certain specially chosen point on the body. Two types of axial symmetry are considered, in which the inertia matrix has three (or two pairs of) equal eigenvalues. The dynamics is shown to be integrable on the intersection of three (or two) invariant hyperplanes of the space of angular velocities.

Reviewed by *Hamad Mohamed Yehia*

MR2517009 (2010b:37158) 37J35 (70H06)

Shamolin, M. V.

On the integrability in elementary functions of some classes of dynamical systems. (Russian. Russian summary)

Vestnik Moskov. Univ. Ser. I Mat. Mekh. **2008,** *no. 3,* 43–49, 72.

From the text (translated from the Russian): “The results of this paper are due to a previous investigation of the applied problem of the motion of a rigid body in a resisting medium [V. A. Samsonov and M. V. Shamolin, Vestnik Moskov. Univ. Ser. I Mat. Mekh. **1989**, no. 3, 51–54, 105; MR1029730 (90k:70007)] in which a transcendental integral expressed in terms of elementary functions was obtained for a particular case. This made it possible to carry out a complete analysis of phase trajectories and to indicate those properties that were ‘robust’ and preserved for some more general systems. The integrability of the system in [op. cit.] is related to latent symmetries. Therefore, it is of interest to study sufficiently large classes of dynamical systems with such latent symmetries.”

MR2482029 (2010f:37032) 37C10 (34A05 37J35 70H05)
Shamolin, M. V. (RS-MOSC)
Dynamical systems with variable dissipation: approaches, methods, and applications.2076-6203
1573-8795
(Russian. English, Russian summaries)
Fundam. Prikl. Mat. **14** (2008), *no. 3,* 3–237; *translation in J. Math. Sci. (N. Y.)* **162** (2009), *no. 6,* 741–908.

Summary: “This work is devoted to the development of qualitative methods in the theory of nonconservative systems that arise, e.g., in such fields of science as the dynamics of a rigid body interacting with a resisting medium, oscillation theory, etc. This material can attract the interest of specialists in the qualitative theory of ordinary differential equations, in rigid body dynamics, as well as in fluid and gas dynamics since the work uses the properties of motion of a rigid body in a medium under the streamline flow around conditions.

“The author obtains a full spectrum of complete integrability cases for nonconservative dynamical systems having nontrivial symmetries. Moreover, in almost all cases of integrability, each of the first integrals is expressed through a finite combination of elementary functions and is a transcendental function of its variables, simultaneously. In this case, the transcendence is meant in the complex analytic sense, i.e., after the continuation of the functions considered to the complex domain, they have essentially singular points. The latter fact is stipulated by the existence of attracting and repelling limit sets in the system considered (for example, attracting and repelling foci).

“The author obtains new families of phase portraits of systems with variable dissipation on lower- and higher-dimensional manifolds. He discusses the problems of their absolute or relative roughness. He discovers new integrable cases of the rigid body motion, including those in the classical problem of motion of a spherical pendulum placed in the over-running medium flow.”

Reviewed by *A. P. Sadovskiĭ*

References

1. S. A. Agafonov, D. V. Georgievskii, and M. V. Shamolin, ”Some actual problems of geometry and mechanics,” the abstract of a talk at the Workshop ”Actual Problems of Geometry and Mechanics,” in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 34.
2. R. R. Aidagulov and M. V. Shamolin, ”A certain improvement of Conway’s algorithm,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 3, 53–55 (2005). MR2171058 (2006d:11150)
3. R. R. Aidagulov and M. V. Shamolin, ”Archimedean uniform structure,” the abstract of a talk at the Workshop ”Actual Problems of Geometry and Mechanics,” in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), pp. 46–51. MR2342523 (2008h:22005)

4. R. R. Aidagulov and M. V. Shamolin, ”General spectral approach to continuous medium dynamics,” the abstract of a talk at the Workshop ”Actual Problems of Geometry and Mechanics,” in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), pp. 52–70. MR2342524 (2009g:74015)
5. R. R. Aidagulov and M. V. Shamolin, ”Phenomenological approach to definition of interphase forces,” *Dokl. Ross. Akad. Nauk*, **412**, No. 1, 44–47 (2007). MR2449984
6. R. R. Aidagulov and M. V. Shamolin, ”Varieties of continuous structures,” USSR Academy of Sciences, Moscow (2007), pp. 71–86. MR2342525 (2008i:58003)
7. H. Airy, ”The soaring of birds,” *Nature*, **28**.
8. G. A. Al’ev, ”Spatial problem of submergence of a disk in an incompressible fluid,” *Izv. Akad. Nauk SSSR, Mekh. Zh. Gaza*, **1**, 17–20 (1988).
9. V. V. Amel’kin, N. A. Lukashevich, and A. P. Sadovskii, *Nonlinear Oscillations in Second-Order Systems* [in Russian], BGU, Minsk (1982). MR0670589 (84a:34037)
10. A. A. Andronov, *Collection of Works* [in Russian], Izd. Akad. Nauk SSSR, Moscow (1956).
11. A. A. Andronov and E. A. Leontovich, ”Some cases of dependence of limit cycles on parameter,” *Uchen. Zap. GTU*, No. 6 (1937).
12. A. A. Andronov and E. A. Leontovich, ”To theory of variations of qualitative structure of plane partition into trajectories,” *Dokl. Akad. Nauk SSSR*, **21**, No. 9 (1938).
13. A. A. Andronov and E. A. Leontovich, ”Birth of limit cycles from a nonrough focus or center and from a nonrough limit cycle,” *Mat. Sb.*, **40**, No. 2 (1956). MR0085413 (19,36a)
14. A. A. Andronov and E. A. Leontovich, ”On birth of limit cycles from a separatrix loop and from separatrix of saddle-node equilibrium state,” *Mat. Sb.*, **48**, No. 3 (1959). MR0131612 (24 #A1461)
15. A. A. Andronov and E. A. Leontovich, ”Dynamical systems of the first degree of nonroughness on the plane,” *Mat. Sb.*, **68**, No. 3 (1965). MR0194657 (33 #2866)
16. A. A. Andronov and E. A. Leontovich, ”Sufficient conditions for nonroughness of the first degree of a dynamical system on the plane,” *Differ. Uravn.*, **6**, No. 12 (1970). MR0279399 (43 #5121)
17. A. A. Andronov, E. A. Leontovich, I. I. Gordon, and A. G. Maier, *Qualitative Theory of Second-Order Dynamical Systems* [in Russian], Nauka, Moscow (1966). MR0199506 (33 #7650)
18. A. A. Andronov, E. A. Leontovich, I. I. Gordon, and A. G. Maier, *Bifurcation Theory of Dynamical Systems on the Plane* [in Russian], Nauka, Moscow (1967). MR0235228 (38 #3539)
19. A. A. Andronov and L. S. Pontryagin, ”Rough systems,” *Dokl. Akad. Nauk SSSR*, **14**, No. 5, 247–250 (1937).
20. A. A. Andronov, A. A. Vitt, and S. E. Khaikin, *Oscillation Theory* [in Russian], Nauka, Moscow (1981). MR0665745 (83i:34002)
21. D. V. Anosov, ”Geodesic flows on closed Riemannian manifolds of negative curvature,” *Tr. Mat. Inst. Akad. Nauk SSSR*, **90** (1967). MR0224110 (36 #7157)
22. P. Appel, *Theoretical Mechanics*, Vols. I, II [Russian translation], Fizmatgiz, Moscow (1960).
23. S. Kh. Aranson, ”Dynamical systems on two-dimensional manifolds,” in: *Proc. of the 5th Int. Conf. on Nonlinear Oscillations*, Vol. 2 [in Russian], Institute of Mathematics, Academy of

Sciences of UkrSSR (1970).
24. S. Kh. Aranson and V. Z. Grines, ”Topological classification of flows on two-dimensional manifolds,” *Usp. Mat. Nauk*, **41**, No. 1 (1986). MR0832412 (87j:58075)
25. Yu. A. Arkhangel’skii, *Analytical Rigid Body Dynamics* [in Russian], Nauka, Moscow (1977).
26. V. I. Arnol’d, ”Hamiltionian property of Euler equations of rigid body dynamics in ideal fluid,” *Usp. Mat. Nauk*, **24**, No. 3, 225–226 (1969). MR0277163 (43 #2900)
27. V. I. Arnol’d, *Additional Chapters of Theory of Ordinary Differential Equations* [in Russian], Nauka, Moscow (1978). MR0526218 (80i:34001)
28. V. I. Arnol’d, *Ordinary Differential Equations* [in Russian], Nauka, Moscow (1984) MR0799024 (86i:34001)
29. V. I. Arnol’d, *Mathematical Methods of Classical Mechanics* [in Russian], Nauka, Moscow (1989). MR1037020 (93c:70001)
30. V. I. Arnol’d, V. V. Kozlov, and A. I. Neishtadt, ”Mathematical aspects of classical and celestial mechanics,” in: *Progress in Science and Technology, Ser. on Contemporary Problems in Mathematics, Fundamental Direction* [in Russian], Vol. 3, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (1985).
31. D. Arrowsmith and C. Place, *Ordinary Differential Equations. Qualitative Theory with Applications* [Russian translation], Mir, Moscow (1986).
32. I. M. Babakov, *Oscillation Theory* [in Russian], Nauka, Moscow (1965). MR0187444 (32 #4894)
33. V. I. Babitskii and V. L. Krupenin, *Oscillations in Strongly Nonlinear Systems* [in Russian], Nauka, Moscow (1985). MR0833070 (88f:70021)
34. G. F. Baggis, ”Rough systems of two differential equations,” *Usp. Mat. Nauk*, **10**, No. 4. (1955).
35. E. A. Barbashin and V. A. Tabueva, *Dynamical Systems with Cylindrical Phase Space* [in Russian], Nauka, Moscow (1969). MR0338509 (49 #3273)
36. N. N. Bautin, ”On number of limit cycles that are born from equlibrium state of focus or center type under variation of coefficients,” *Mat. Sb.*, **30 (72)**, No. 1 (1952). MR0045893 (13,652a)
37. N. N. Bautin, ”On approximation and roughness of the parameter space of a dynamical system,” in: *Proc. of the 5th Int. Conf. on Nonlinear Oscillations* [in Russian], Institute of Mathematics and Mechanics, UkrSSR Acad. Sci., Kiev (1970).
38. N. N. Bautin, ”Certain methods for qualitative study of dynamical systems related to a field turn,” *Prikl. Mat. Mekh.*, **37**, No. 6 (1973). MR0361262 (50 #13708)
39. N. N. Bautin and E. A. Leontovich, *Methods and Tools for Qualitative Study of Dynamical Systems on the Plane* [in Russian], Nauka, Moscow (1976). MR0466732 (57 #6609)
40. A. D. Bazykin, Yu. A. Kuznetsov, and A. I. Khibnik, ”Bifurcation diagrams of dynamical systems on plane. An informational material,” ONTI NTsBI Akad. Nauk SSSR, Pushchino (1985).
41. V. V. Beletskii, *Artificial Satellite Motion with Respect to Center of Mass* [in Russian], Nauka, Moscow (1965).
42. V. V. Beletskii, *Satellite Motion with Respect to Center of Mass in Gravitational Field* [in Russian], MGU, Moscow (1975).
43. V. V. Beletskii and A. M. Yanshin, *Influence of Aerodynamical Forces on Rotational Motion of*

Artificial Satellites [in Russian], Naukova Dumka, Kiev (1984).
44. A. V. Belyaev, "On many-dimensional body motion with clamped point in gravity force field," *Mat. Sb.*, **114**, No. 3, 465–470 (1981). MR0610209 (82i:58027)
45. I. Bendikson, "On curves defined by differential equations," *Usp. Mat. Nauk*, **9** (1941).
46. M. Berger, *Geometry*, Vols. I, II [Russian translation], Mir, Moscow (1984). MR0807773 (86k:51001a)
47. A. L. Besse, *Manifolds All of Whose Geodesics Are Closed* [Russian translation], Mir, Moscow (1981). MR0641690 (83i:53059)
48. J. Birkhoff, *Dynamical Systems* [Russian translation], Gostekhizdat, Moscow (1941).
49. R. L. Bishop, *Oscillations* [Russian translation], Nauka, Moscow (1986).
50. Yu. K. Bivin, "Change of direction of rigid body motion on medium separation boundary," *Izv. Akad. Nauk SSSR, Mekh. Tverd. Tela*, No. 4, 105–109 (1981).
51. Yu. K. Bivin, Yu. M. Glukhov, and Yu. V. Permyakov, "Vertical entrance of rigid bodies to water," *Izv. Akad. Nauk SSSR, Mekh. Zh. Gaza*, No. 6, 3–9 (1985).
52. Yu. K. Bivin, V. V. Viktorov, and L. P. Stepanov, "Study of rigid body motion in a clayey medium," *Izv. Akad. Nauk SSSR, Mekh. Tverd. Tela*, No. 2, 159–165 (1978).
53. G. A. Bliss, *Lectures on the Calculus of Variations* [Russian translation], Gostekhizdat, Moscow (1941).
54. M. Blix, "Une nouvelle théorie sur le vol a viole des oiseaux," *Revue Generale Sciences Pures Appliquees* (1890).
55. V. N. Bogaevskii and A. Ya. Povzner, *Algebraic Methods in Nonlinear Perturbation Theory* [in Russian], Nauka, Moscow (1987). MR0889894 (88j:34001)
56. O. I. Bogoyavlenskii, *Methods of Qualitative Theory of Dynamical Systems in Astrophysics and Gas Dynamics* [in Russian], Nauka, Moscow (1980). MR0604548 (84f:85007)
57. O. I. Bogoyavlenskii, "Dynamics of a rigid body with n ellipsoidal holes filled with a magnetic fluid," *Dokl. Akad. Nauk SSSR*, **272**, No. 6, 1364–1367 (1983). MR0722875 (85e:58042)
58. O. I. Bogoyavlenskii, "Some integrable cases of Euler equations," *Dokl. Akad. Nauk SSSR*, **287**, No. 5, 1105–1108 (1986). MR0839710 (87j:70005)
59. O. I. Bogoyavlenskii and G. F. Ivakh, "Topological analysis of integrable cases of V. A. Steklov," *Usp. Mat. Nauk*, **40**, No. 4, 145–146 (1985). MR0807729 (87g:58035)
60. G. L. Boiko and V. A. Eroshin, "Finding overloadings under a shock of profile on fluid surface," *Izv. Akad. Nauk SSSR, Mekh. Zh. Gaza*, No. 1, 35–38 (1975).
61. S. V. Bolotin, "On first integrals of systems with gyroscopic forces," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 6, 75–82 (1984). MR0775310 (86j:70012)
62. S. V. Bolotin and V. V. Kozlov, "On asymptotic solutions of dynamics equations," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 4, 84–89 (1980). MR0585456 (82c:70024)
63. I. T. Borisenok, B. Ya. Lokshin, and V. A. Privalov, "On flight dynamics of axially-symmetric rotating bodies in air medium," *Izv. Akad. Nauk SSSR, Mekh. Tverd. Tela*, No. 2, 35–42 (1984).
64. I. T. Borisenok and M. V. Shamolin, "Algorithms for solving differential diagnosis problem," in: *Abstracts of Reports of Math. Conf. "Erugin Readings III" (Brest, May 14–16, 1996)* [in Russian], Brest (1996), p. 102.
65. I. T. Borisenok and M. V. Shamolin, "Existence and uniqueness of solution of general differen-

tial diagnosis problem," in: *Abstracts of 5th Int. Conference-Workshop "Engineering-Physical Problems of New Technics (Moscow, May 19–22, 1998)* [in Russian], MGTU, Moscow (1998), pp. 6–7.
66. I. T. Borisenok and M. V. Shamolin, "Existence of solution of general differential diagnosis problem," in: *Abstracts of Reports of Conf. Devoted to the 40th Anniversary of Institute of Mechanics of Moscow State University (November 22–26, 1999)* [in Russian], MGU, Moscow (1999), pp. 259–260.
67. I. T. Borisenok and M. V. Shamolin, "Solution of differential diagnosis problem," *Fundam. Prikl. Mat.*, **5**, No. 3, 775–790 (1999). MR1806854
68. I. T. Borisenok and M. V. Shamolin, "Extended differential diagnosis problem," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," *Fundam. Prikl. Mat.*, **7**, No. 1, 308 (2001).
69. I. T. Borisenok and M. V. Shamolin, "Solution of differential diagnosis problem by statistical trial method," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 1, 29–31 (2001). MR1844242 (2002d:90024)
70. I. T. Borisenok and M. V. Shamolin, "Extended differential diagnosis problem," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in*
71. *Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), pp. 20–21.
72. N. Bourbaki, *Integration* [Russian translation], Nauka, Moscow (1970). MR0274688 (43 #450)
73. N. Bourbaki, *Lie Groups and Algebras* [Russian translation], Mir, Moscow (1972).
74. A. V. Brailov, "Some cases of complete integrability of Euler equations and applications," *Dokl. Akad. Nauk SSSR*, **268**, No. 5, 1043–1046 (1983). MR0697820 (84m:58050)
75. A. D. Bryuno, *Local Method of Nonlinear Analysis of Differential Equations* [in Russian], Nauka, Moscow (1979). MR0542758 (82b:34033)
76. N. N. Bukhgol'ts, *Basic Course of Theoretical Mechanics*, Vols. I, II [in Russian], Nauka, Moscow (1972).
77. A. A. Burov, "Nonintegrability of equations of satellite plane oscillations on an elliptic orbit," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 1, 71–73 (1984). MR0735960 (85a:70053)
78. A. A. Burov and G. I. Subkhankulov, "On rigid body motion in magnetic field," *Prikl. Mat. Mekh.*, **50**, No. 6, 960–966 (1986).
79. N. N. Butenina, "Bifurcations of separatrices and limit cycles of a two-dimensional dynamical system under a turn of field," *Differ. Uravn.*, **9**, No. 8 (1973). MR0333332 (48 #11657)
80. N. N. Butenina, "Separatrix bifurcations of a two-dimensional dynamical system under a turn of field," in: *Qualitative Methods of Theory of Differential Equations and Their Applications, Scientific Notes of Gor'kii State University* [in Russian], Vol. 187 (1973). MR0594952 (58 #28852a)
81. N. N. Butenina, "On possibility of turning vector field of dynamical system by an angle with passage only through systems of first nonroughness degree," in: *Inter-Colleges Collection "Oscillation Theory, Applied Mathematics, and Cybernetics,"* [in Russian], Gor'kii (1974).
82. N. N. Butenina, "To bifurcation theory of dynamical systems under a turn of field," *Differ.*

Uravn., **10**, No. 7 (1974). MR0357960 (50 #10425)
83. M. L. Byalyi, "On first integrals polynomial in impulses for a mechanical system on a two-dimensional torus," *Funkts. Anal. Prilozh.*, **21**, No. 4, 64–65 (1987). MR0925074 (89c:70029)
84. G. S. Byushgens and R. V. Studnev, *Dynamics of Longitudinal and Lateral Motion* [in Russian], Mashinostroenie, Moscow (1969).
85. G. S. Byushgens and R. V. Studnev, *Airplane Dynamics. A Spatial Motion* [in Russian], Mashinostroenie, Moscow (1988).
86. S. A. Chaplygin, "On motion of heavy bodies in an incompressible fluid," in: *A Complete Collection of Works* [in Russian], Vol. 1, Izd. Akad. Nauk SSSR, Leningrad (1933), pp. 133–135.
87. S. A. Chaplygin, *Selected Works* [in Russian], Nauka, Moscow (1976). MR0424502 (54 #12464)
88. F. L. Chernous'ko, L. D. Akulenko, and B. N. Sokolov, *Control of Oscillations* [in Russian], Nauka, Moscow (1980).
89. E. A. Coddington and N. Levinson, *Theory of Ordinary Differential Equations* [Russian translation], Inostr. Lit., Moscow (1958).
90. S. A. Dovbysh, "Intersection of asymptotic surfaces of a perturbed Euler-Poinsot problem," *Prikl. Mat. Mekh.*, **51**, No. 3, 363–370 (1987). MR0960031 (89g:70005)
91. S. A. Dovbysh, "Separatrix splitting and birth of isolated periodic solutions in Hamiltonian system with one and half degrees of freedom," *Usp. Mat. Nauk*, **44**, No. 2, 229–230 (1989). MR0998366 (90i:58140)
92. S. A. Dovbysh, "Splitting of separatrices of unstable uniform rotations, and nonintegrability of a perturbed Lagrange problem," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, **3**, 70–77 (1990). MR1064299 (92d:70005)
93. B. A. Dubrovin and S. P. Novikov, "On Poisson brackets of hydrodynamic type," *Dokl. Akad. Nauk SSSR*, **279**, No. 2, 294–297 (1984). MR0770656 (86e:58021)
94. B. A. Dubrovin, S. P. Novikov, and A. T. Fomenko, *Modern Geometry. Theory and Applications* [in Russian], Nauka, Moscow (1979). MR0566582 (81f:53001)
95. H. Dulac, *On Limit Cycles* [Russian translation], Nauka, Moscow (1980). MR0597517 (82k:34031)
96. G. E. Dzhakal'ya, *Perturbation Theory Methods for Linear Systems* [in Russian], Nauka, Moscow (1967).
97. V. A. Eroshin, "Cone penetration into a fluid layer," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 5, 53–59 (1963). MR0155493 (27 #5427)
98. V. A. Eroshin, "Plate reflection from ideal incompressible fluid surface," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 6, 99–104 (1970).
99. V. A. Eroshin, "Submergence of a disk in a compressible fluid at an angle to a free surface," *Izv. Akad. Nauk SSSR, Mekh. Zh. Gaza*, **2**, 142–144 (1983).
100. V. A. Eroshin, "Experimental study of compression forces excited in an elasic cylinder under its entrance to water," in: *Applied Problems of Strength and Plasticity* [in Russian], Issue 46, Gor'kii State Univ., Gor'kii (1990), pp. 54–59.
101. V. A. Eroshin, *Penetration of an Elastic Cylinder into Water at a High Speed*, preprint, No. 5,

Institute of Mechanics, Moscow State Univ., Moscow (1991).
102. V. A. Eroshin, "Experimental study of entrance of an elastic cylinder into water at a high speed," *Izv. Ross. Akad. Nauk, Mekh. Zh. Gaza*, No. 5, 20–30 (1992).
103. V. A. Eroshin, G. A. Konstantinov, N. I. Romanenkov, and Yu. L. Yakimov, "Experimental finding of pressure on a disk under its submergence in a compressible fluid at an angle to a free surface," *Izv. Akad. Nauk SSSR, Mekh. Zh. Gaza*, No. 2, 21–25 (1988).
104. V. A. Eroshin, G. A. Konstantinov, N. I. Romanenkov, and Yu. L. Yakimov, "Experimental finding of hydrodynamic force moment under an asymmetric penetration of a disk into a compressible fluid," *Izv. Ross. Akad. Nauk, Mekh. Zh. Gaza*, No. 5, 88–94 (1990).
105. V. A. Eroshin, A. V. Plyusnin, Yu. A. Sozonenko, and Yu. L. Yakimov, "On methodology for studying bend oscillations of an elastic cylinder under its entrance into water at an angle to a free surface," *Izv. Akad. Nauk SSSR, Mekh. Zh. Gaza*, No. 6, 164–167 (1989).
106. V. A. Eroshin, V. A. Privalov, and V. A. Samsonov, "Two model problems of body motion in a resisting medium," in: *Collection of Scientific-Methodological Papers in Theoretical Mechanics* [in Russian], Issue 18, Nauka, Moscow (1987), pp. 75–78.
107. V. A. Eroshin, N. I. Romanenkov, I. V. Serebryakov, and Yu. L. Yakimov, "Hydrodynamic forces under a shock of blunt bodies on compressible fluid surface," *Izv. Akad. Nauk SSSR, Mekh. Zh. Gaza*, No. 6, 44–51 (1980).
108. V. A. Eroshin, V. A. Samsonov, and M. V. Shamolin, "On body motion under streamline flow-around," in: *Abstracts of All-Union Conf. on Stability of Motion, Oscillations of Mechanical Systems, and Aerodynamics, Moscow, February 2–4, 1988* [in Russian], Moscow Aviation Institute, Moscow (1988), p. 21.
109. V. A. Eroshin, V. A. Samsonov, and M. V. Shamolin, "Mathematical modelling in problem of body drag in a medium under streamline flow-around," the abstract of a talk at the Chebyshev Readings, *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 6, 17 (1995).
110. V. A. Eroshin, V. A. Samsonov, and M. V. Shamolin, "Model problem of body drag in a resisting medium under streamline flow-around," *Izv. Ross. Akad. Nauk, Mekh. Zh. Gaza*, No. 3, 23–27 (1995).
111. R. R. Fakhrutdinova and M. V. Shamolin, "On preservation of phase volume in 'zero mean' variable dissipation systems," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," *Fund. Prikl. Mat.*, **7**, No. 1, 311 (2001).
112. R. R. Fakhrutdinova and M. V. Shamolin, "On preservation of phase volume in 'zero mean' variable dissipation systems," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 22.
113. A. T. Fomenko, "Realizations of cycles in compact symmetric spaces by totally geodesic submanifolds," *Dokl. Akad. Nauk SSSR*, **195**, No. 4, 789–792 (1970). MR0276997 (43 #2735)
114. A. T. Fomenko, "Complete integrability of certain classical Hamiltonian systems," in: *Monogenic Functions and Mappings*, Institute of Mathematics, UkrSSR Academy of Sciences, Kiev (1982), pp. 3–19. MR0701707 (84k:58115)
115. A. T. Fomenko, "On absolute minimizers of volume functional and Dirichlet functional on Rie-

mannian manifolds," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 6, 87–94 (1983). MR0728556 (86d:58028)
116. F. R. Gantmakher, *Lectures on Analytical Mechanics* [in Russian], Nauka, Moscow (1960).
117. D. V. Georgievskii and M. V. Shamolin, "Kinematics and mass geometry of a rigid body with a fixed point in $\mathbb{R}^n$," *Dokl. Ross. Akad. Nauk*, **380**, No. 1, 47–50 (2001). MR1867984 (2003a:70002)
118. D. V. Georgievskii and M. V. Shamolin, "On kinematics of a rigid body with a fixed point in $\mathbb{R}^n$," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," *Fundam. Prikl. Mat.*, **7**, No. 1, 315 (2001).
119. D. V. Georgievskii and M. V. Shamolin, "Generalized dynamical Euler equations for a rigid body with a fixed point in $\mathbb{R}^n$," *Dokl. Ross. Akad. Nauk*, **383**, No. 5, 635–637 (2002). MR1930111 (2003g:70008)
120. D. V. Georgievskii and M. V. Shamolin, "First integrals of equations of motion for a generalized gyroscope in $\mathbb{R}^n$," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 5, 37–41 (2003). MR2042218 (2004j:70012)
121. D. V. Georgievskii and M. V. Shamolin, "First integrals for equations of motion of a generalized gyroscope in n-dimensional space," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 31.
122. D. V. Georgievskii and M. V. Shamolin, "Generalized dynamical Euler equations for a rigid body with a fixed point in $\mathbb{R}^n$," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 30.
123. D. V. Georgievskii and M. V. Shamolin, "On kinematics of a rigid body with a fixed point in $\mathbb{R}^n$," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 24–25.
124. D. V. Georgievskii and M. V. Shamolin, "Valerii Vladimirovich Trofimov," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 5–6. MR2342521
125. D. V. Georgievskii, V. V. Trofimov, and M. V. Shamolin, "Geometry and mechanics: problems, approaches, and methods," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," *Fundam. Prikl. Mat.*, **7**, No. 1, 301 (2001).
126. D. V. Georgievskii, V. V. Trofimov, and M. V. Shamolin, "On certain topological invariants of flows with complex potential," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," *Fundam. Prikl. Mat.*, **7**, No. 1, 305 (2001).
127. D. V. Georgievskii, V. V. Trofimov, and M. V. Shamolin, "Geometry and mechanics: problems, approaches, and methods," the abstract of a talk at the Workshop "Actual Problems of Geometry

and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 16.
128. D. V. Georgievskii, V. V. Trofimov, and M. V. Shamolin, "On certain topological invariants of flows with complex potential," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian],
129. Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007) p. 19.
130. E. B. Gledzer, F. S. Dolzhanskii, and A. M. Obukhov, *Systems of Hydrodynamic Type and Their Applications* [in Russian], Nauka, Moscow (1981). MR0647315 (83e:76002)
131. C. Godbillon, *Differential Geometry and Analytical Mechanics* [Russian translation], Mir, Moscow (1973).
132. V. V. Golubev, *Lectures on Analytical Theory of Differential Equations* [in Russian], Gostekhizdat, Moscow (1950). MR0014552 (7,301a)
133. V. V. Golubev, *Lectures on Integrating Equations of Heavy Body Motion Around a Fixed Point*, Gostekhizdat, Moscow (1953).
134. S. M. Gorlin, *Experimental Aerodynamics* [in Russian], Vysshaya Shkola, Moscow (1970).
135. G. V. Gorr, L. V. Kudryashova, and L. A. Stepanova, *Classical Problems of Rigid Body Dynamics* [in Russian], Naukova Dumka, Kiev (1978). MR0519067 (80m:70001)
136. D. N. Goryachev, "New cases of integrability of dynamical Euler equations," *Varshav. Univ. Izv.*, **3**, 1–15 (1916).
137. I. S. Gradshtein and I. M. Ryzhik, *Tables of Integrals, Series Sums, and Derivatives* [in Russian], Gostekhizdat, Moscow (1963).
138. E. A. Grebennikov and Yu. A. Ryabov, *Constructive Methods of Analysis of Nonlinear Systems* [in Russian], Nauka, Moscow (1979).
139. Ph. Griffits, *Exterior Differential Systems and the Calculus of Variations* [Russian translation], Mir, Moscow (1986) MR0879421 (89b:58016)
140. D. M. Grobman, "On homeomorphism of systems of differential equations," *Dokl. Akad. Nauk SSSR*, **128**, No. 5, 880–881 (1959). MR0121545 (22 #12282)
141. D. M. Grobman, "Topological classification of neighborhoods of a singular point in n-dimensional space," *Mat. Sb.*, **56**, No. 1, 77–94 (1962). MR0138829 (25 #2270)
142. D. A. Gudkov, "On concept of nonroughness and degrees of nonroughness for plane algebraic curves," *Mat. Sb.*, **67**, No. 4, 481–527 (1965). MR0196584 (33 #4771)
143. M. I. Gurevich, *Jet Theory of Ideal Fluid* [in Russian], Nauka, Moscow (1979).
144. Ph. Hartman, *Ordinary Differential Equations* [Russian translation], Mir, Moscow (1970). MR0352574 (50 #5061)
145. C. Hayashi, *Nonlinear Oscillations in Physical Systems* [Russian translation], Mir, Moscow (1968).
146. Yu. S. Il'yashenko, "Memoir 'On Limit Cycles' of Dulac and relative problems of local theory of differential equations," *Usp. Mat. Nauk*, **40**, No. 6 (1985). MR0815489 (87j:34052)
147. A. Yu. Ishlinsky, *Orientation, Gyroscopes, and Inertial Navigation* [in Russian], Nauka,

Moscow (1976).
148. A. Yu. Ishlinsky and D. M. Klimov, ”Some aspects of the solution of the main problem of inertial navigation,” *J. Inst. Navig.*, **23**, No. 4 (1970).
149. T. A. Ivanova, ”On Euler equations in models of theoretical physics,” *Mat. Zametki*, **52**, No. 2, 43–51 (1992). MR1187873 (93i:58032)
150. C. Jacobi, *Lectures on Dynamics* [Russian translation], ONTI, Moscow (1936).
151. A. B. Katok, ”Dynamical systems with hyperbolic structure,” in: *9th Summer Mathematical School* [in Russian], Kiev (1972), pp. 125–211. MR0377991 (51 #14160)
152. Ch. Kittel, W. D. Knight, and M. A. Ruderman, *Berkeley Physics Course, Vol. I. Mechanics* [Russian translation], Nauka, Moscow (1983).
153. N. N. Kolesnik...v, ”Natural systems with solvable symmetry group,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 5, 99–103 (1978).
154. A. N. Kolmogorov, ”General theory of dynamical systems and classical mechanics,” in: *Int. Math. Congress in Amsterdam* [in Russian], Fizmatgiz, Moscow (1961), pp. 187–208.
155. V. V. Kozlov, *Qualitative Analysis Methods in Rigid Body Dynamics* [in Russian], Izd. Mosk. Univ., Moscow (1980). MR0598628 (82e:70002)
156. V. V. Kozlov, ”A note on stationary vortex motions of a continuous medium,” *Prikl. Mat. Mekh.*, **47**, No. 2, 341–342 (1983). MR0740637 (85c:76023)
157. V. V. Kozlov, ”Hydrodynamics of Hamiltonian systems,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 6, 10–22 (1983). MR0728549 (85e:58048)
158. V. V. Kozlov, ”Integrability and nonintegrability in Hamiltonian mechanics,” *Usp. Mat. Nauk*, **38**, No. 1, 3–67 (1983). MR0693718 (84k:58076)
159. V. V. Kozlov, ”To problem of rigid body rotation in magnetic field,” *Izv. Akad. Nauk SSSR, Mekh. Tverd. Tela*, **6**, 28–33 (1985).
160. V. V. Kozlov, ”On rigid body fall in ideal fluid,” *Izv. Akad. Nauk SSSR, Mekh. Tverd. Tela*, **5**, 10–17 (1989).
161. V. V. Kozlov, ”To problem of heavy rigid body fall in a resisting medium,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 1, 79–87 (1990). MR1064287 (91m:76041)
162. V. V. Kozlov, ”Vortex theory of a top,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 4, 56–62 (1990). MR1086606 (93d:58055)
163. V. V. Kozlov, ”On stochastization of ideal fluid plane-parallel flows,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 1, 72–76 (1991).
164. V. V. Kozlov and N. N. Kolesnikov, ”On integrability of Hamiltonian systems,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 6, 88–91 (1979). MR0561414 (81c:58037)
165. V. V. Kozlov and D. A. Onishchenko, ”Nonintegrability of Kirchhoff equations,” *Dokl. Akad. Nauk SSSR*, **266**, No. 6, 1298–1300 (1982). MR0681629 (84e:58033)
166. M. A. Krasnosel’skii, A. I. Perov, A. I. Povolotskii, and P. P. Zabreiko, *Vector Fields on Plane* [in Russian], Fizmatgiz, Moscow (1963).
167. N. M. Krylov and N. N. Bogolyubov, *New Methods of Nonlinear Mechanics* [in Russian], ONTI, Moscow (1934).
168. N. N. Krylov and N. N. Bogolyubov, *An Introduction to Nonlinear Mechanics* [in Russian], Izd. Akad. Nauk SSSR, Moscow (1937).

169. A. G. Kushnirenko, ”Problems of general theory of dynamical systems on manifolds,” in: *9th Summer Math. School* [in Russian], Kiev (1972), pp. 52–124.
170. G. Lamb, *Hydrodynamics* [Russian translation], Fizmatgiz, Moscow (1947).
171. L. D. Landau and E. M. Lifshits, *Mechanics* [in Russian], Nauka, Moscow (1968). MR0389014 (52 #9846)
172. S. Lang, *An Introduction to Theory of Differentiable Manifolds* [Russian translation], Mir, Moscow (1967).
173. J. U. Leech, *Classical Mechanics* [Russian translation], Inostr. Lit., Moscow (1961).
174. S. Lefschetz, *Geometric Theory of Differential Equations* [Russian translation], Inostr. Lit., Moscow (1961). MR0121519 (22 #12257)
175. E. A. Leontovich, ”To problem of definition of rough dynamical system,” in: *Nonlinear Vibrations Problems, Second Conf. on Nonlinear Vibrations* [in Russian], Warsaw (1964).
176. E. A. Leontovich and A. G. Maier, ”On trajectories determining the qualitative structure of partition of a sphere into trajectories,” *Dokl. Akad. Nauk SSSR*, **14**, No. 5, 251–254 (1937).
177. E. A. Leontovich and A. G. Maier, ”On scheme determining topological structure of partition into trajectories,” *Dokl. Akad. Nauk SSSR*, **103**, No. 4 (1955).
178. E. A. Leontovich and L. P. Shil’nikov, ”State of the art of bifurcation theory for dynamical systems,” in: *Qualitative Methods of Nonlinear Oscillation Theory* [in Russian], Vol. 2, Institute of Mathematics, UkrSSR Akademy of Sciences (1970).
179. O. Liliental, *Der Vogelflug als Grundlage der Fliegekunst*, Berlin (1889).
180. B. Ya. Lokshin, ”On a certain motion of a rapidly rotating body in air,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 6, 93–98 (1970).
181. B. Ya. Lokshin, ”On stability of plane motion of a rapidly rotating symmetric body in atmosphere,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 6, 113–118 (1971).
182. B. Ya. Lokshin, ”On skrew motion of a rapidly rotating symmetric rigid body in air,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 4, 79–86 (1973).
183. B. Ya. Lokshin, ”On stability of stationary motions of a rapidly rotating symmetric rigid body in air,” *Izv. Akad. Nauk SSSR, Mekh. Tverd. Tela*, No. 2, 18–24 (1976).
184. B. Ya. Lokshin and O. Yu. Cherkasov, ”On structure of optimal trajectories of motion of a rotating rigid body in a resisting medium,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 1, 63–68 (1990).
185. B. Ya. Lokshin, Yu. M. Okunev, V. A. Samsonov, and M. V. Shamolin, ”Some integrable cases of rigid body spatial oscillations in a resisting medium,” in: *Abstracts of Reports of XXI Sci. Readings in Cosmonautics, Moscow, January 28–31, 1997* [in Russian], Institute of History of Natural Sciences and Technics, Russian Academy of Sciences, Moscow (1997), pp. 82–83.
186. B. Ya. Lokshin, V. A. Privalov, and V. A. Samsonov, *An Introduction to Problem of Motion of a Body in a Resisting Medium* [in Russian], Izd. Mosk. Univ., Moscow (1986).
187. B. Ya. Lokshin, V. A. Privalov, and V. A. Samsonov, *An Introduction to Problem of Motion of a Body and a Point in a Resisting Medium* [in Russian], Izd. Mosk. Univ., Moscow (1992).
188. V. V. Lunev, ”A hydrodynamical analogy of problem of rigid body motion with a fixed point in Lorenz force field,” *Dokl. Akad. Nauk SSSR*, **276**, No. 2, 351–355 (1984). MR0745042 (85i:78009)

189. A. M. Lyapunov, ”A new integrability case of equations of rigid body motion in a fluid,” in: *A Collection of Works* [in Russian], Vol. I, Izd. Akad. Nauk SSSR, Moscow (1954), pp. 320–324.
190. I. G. Malkin, *Some Problems of Nonlinear Oscillation Theory* [in Russian], Gostekhteorizdat, Moscow (1956).
191. Yu. I. Manin, ”Algebraic aspects of theory of nonlinear differential equations,” in: *Progress in Science and Technology, Series on Contemporary Problems in Mathematics* [in Russian], Vol. 11, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (1978), pp. 5–112.
192. E.-J. Marey, *Le vol des oiseaux*, Chap. XX, Paris (1890).
193. A. P. Markeev, ”On integrability of problem of ball rolling with a multiconnected hole filled with ideal fluid,” *Izv. Akad. Nauk SSSR, Mekh. Tverd. Tela*, No. 1, 64–65 (1986).
194. A. P. Markeev, *Theoretical Mechanics* [in Russian], Nauka, Moscow (1990). MR1070718 (91g:70001)
195. J. Marsden and M. McCracken, *The Hopf Bifurcation and Its Applications* [Russian translation], Mir, Moscow (1986).
196. W. Miller, *Symmetry and Separation of Variables* [Russian translation], Mir, Moscow (1981). MR0645900 (83a:58098)
197. Yu. A. Mitropol’skii and A. K. Lopatin, *Asymptotic Decomposition of Systems of Ordinary Differential Equations with Small Parameter*, preprint, Institute of Mathematics, UkrSSR, Academy of Sciences, No. 86–71, Kiev (1986). cf. MR 88c:34056
198. Yu. A. Mitropol’skii and O. B. Lykova, *Integral Manifolds in Nonlinear Mechanics* [in Russian], Nauka, Moscow (1973). MR0364771 (51 #1025)
199. N. N. Moiseev, *Asymptotic Methods of Nonlinear Mechanics* [in Russian], Nauka, Moscow (1969). MR0645354 (83i:70001)
200. N. N. Moiseev and V. V. Rumyantsev, *Dynamics of a Body with Holes Containing a Fluid* [in Russian], Nauka, Moscow (1965).
201. L.-P. Mouillard, *L’empire de l’air*, Paris (1881).
202. R. F. Nagaev and K. Sh. Khodzhaev, *Oscillations of Mechanical Systems with Periodic Structure* [in Russian], Fan, Tashkent (1973).
203. Yu. I. Neimark, ”On motions close to a double-asymptotic motion,” *Dokl. Akad. Nauk SSSR*, **172**, No. 5, 1021–1024 (1967). MR0209601 (35 #498)
204. Yu. I. Neimark, ”Structure of motion of a dynamical system in a neighborhood of a homoclinic curve,” in: *5th Summer Math. School* [in Russian], Kiev (1968), pp. 400–435.
205. Yu. I. Neimark and N. A. Fufaev, *Dynamics of Nonholonomic Systems* [in Russian], Nauka, Moscow (1967).
206. V. V. Nemytskii and V. V. Stepanov, *Qualitative Theory of Differential Equations* [in Russian], Gostekhizdat, Moscow (1949).
207. Z. Nitetski, *Introduction to Differential Dynamics* [Russian translation], Mir, Moscow (1975). MR0649789 (58 #31211)
208. S. P. Novikov and I. Schmeltzer, ”Periodic solutions of Kirchhoff equations of body free and ideal fluid free motion and extended Lyusternik-Shnirel’man-Morse theory,” *Funkts. Anal. Prilozh.*, **15**, No. 3, 54–66 (1981). MR0630339 (83a:58026a)

209. V. A. Odareev, *Decompositional Analysis of Dynamics and Stability of Longitudinal Perturbed Motion of the Ekranoplan* [in Russian], Doctoral Dissertation, MGAI, Moscow (1995).
210. Yu. M. Okunev, V. A. Privalov, and V. A. Samsonov, "Some problems of body motion in a resisting medium," in: *Proc. of All-Union Conf. "Nonlinear Phenomena"* [in Russian], Nauka, Moscow (1991), pp. 140–144.
211. Yu. M. Okunev and V. A. Sadovnichii, "Model dynamical systems of a certain problem of external ballistics and their analytical solutions," in: *Problems of Modern Mechanics* [in Russian], Izd. Mosk. Univ., Moscow (1998), pp. 28–46.
212. Yu. M. Okunev, V. A. Sadovnichii, V. A. Samsonov, and G. G. Chernyi, "A complex for modelling flight dynamics problems," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 6, 66–75 (1996).
213. B. Onniere, "Etude sur le vol plane," *L'Aeronaute* (1891).
214. J. Palais and S. Smale, "Structural stability theorems," in: *A Collection of Translations. Mathematics* [in Russian], **13**, No. 2 (1969), pp. 145–155.
215. J. Palis and W. De Melu, *Geometric Theory of Dynamical Systems, An Introduction* [Russian translation], Mir, Moscow (1986). MR0848132 (87m:58048)
216. A. von Parseval, *Die Mechanik des Vogelflugs*, Wisbaden (1889).
217. S. E. Peal, "Soaring of birds," *Nature*, **28**.
218. M. Peixoto, "On structural stability," *Ann. Math.* (2), **69**, 199–222 (1959). MR0101951 (21 #753)
219. M. Peixoto, "Structural stability on two-dimensional manifolds," Topology, **1**, No. 2, 101–120 (1962). MR0142859 (26 #426)
220. M. Peixoto, "On an approximation theorem of Kupka and Smale," *J. Diff. Equ.*, **3**, 214–227 (1966). MR0209602 (35 #499)
221. A. M. Perelomov, "Several remarks on integration of equations of rigid body motion in ideal fluid," *Funkts. Anal. Pril.*, **15**, No. 2, 83–85 (1981). MR0617480 (82j:58066)
222. I. G. Petrovskii, *Lectures on Theory of Ordinary Differential Equations* [in Russian], Gostekhizdat, Moscow (1952). MR0775134 (86b:34002)
223. V. A. Pliss, "On roughness of differential equations given on a torus," *Vestn. Leningr. Univ. Mat.*, **13**, 15–23 (1960). MR0126588 (23 #A3884)
224. V. A. Pliss, *Nonlocal Problems of Oscillation Theory* [in Russian], Nauka, Moscow (1964). MR0171962 (30 #2188)
225. V. A. Pliss, *Integral Sets of Periodic Systems of Differential Equations* [in Russian], Nauka, Moscow (1967).
226. V. A. Pliss, "On stability of an arbitrary system with respect to perturbations small in C sense," *Differ. Uravn.*, **16**, No. 10, 1891–1892 (1980). MR0595574 (82b:34068)
227. T. I. Pogosyan, "Construction of bifurcation sets in a certain problem of rigid body dynamics," *Izv. Akad. Nauk SSSR, Mekh. Tverd. Tela*, **12**, 9–16 (1980). MR0571420 (83b:70004)
228. H. Poincaré, *On Curves Defined by Differential Equations* [Russian translation], OGIZ, Moscow (1947).
229. H. Poincaré, "New methods in celestial mechanics," in: *Selected Works* [Russian translation], Vols. 1, 2, Nauka, Moscow (1971, 1972).

230. H. Poincaré, *On Science* [Russian translation], Nauka, Moscow (1983). MR0745803 (85k:01056)
231. L. Prandtl and A. Betz, *Ergebnisse der aerodynamischen Versuchsanstalt zu Göttingen*, Berlin (1932).
232. V. A. Privalov and V. A. Samsonov, "On stability of motion of a body auto-rotating in medium flow," *Izv. Akad. Nauk SSSR, Mekh. Tverd. Tela*, **2**, 32–38 (1990).
233. Rayleigh (J. W. Strutt), "The soaring of birds," *Nature*, **28**.
234. R. Reissing, G. Sansone, and R. Conti, *Qualitative Theory of Ordinary Differential Equations* [Russian translation], Nauka, Moscow (1974).
235. V. E. Ryzhova and M. V. Shamolin, "On some analogies in problem of body motion in a resisting medium," in: *Seventh Congress in Theoretical and Applied Mechanics, Moscow, August 15–21, 1991* [in Russian], Moscow (1991).
236. S. T. Sadetov, "Integrability conditions of Kirchhoff equations," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 3, 56–62 (1990). MR1064298 (91m:58081)
237. T. V. Sal'nikova, "On integrability of Kirchhoff equations in symmetric case," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 4, 68–71 (1985). MR0806340 (87i:70008)
238. V. A. Samsonov, "On stability of solutions of systems of differential equations in some cases," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 5, 74–78 (1962). MR0144023 (26 #1571)
239. V. A. Samsonov, "On stability of equilibrium of physical pendulum with fluid filling," *Prikl. Mat. Mekh.*, **30**, No. 6, 1112–1114 (1966).
240. V. A. Samsonov, "On problem of minimum of a functional in studying stability of motion of a body with fluid filling," *Prikl. Mat. Mekh.*, **31**, No. 3, 523–526 (1967). MR0238519 (38 #6795)
241. V. A. Samsonov, "On quasi-stationary motions of mechanical systems," *Izv. Akad. Nauk SSSR, Mekh. Tverd. Tela*, No. 1, 32–50 (1978). MR0536257 (80e:70017)
242. V. A. Samsonov, *Issues on Mechanics. Some Problems, Phenomena, and Paradoxes* [in Russian], Nauka, Moscow (1980).
243. V. A. Samsonov, "On body rotation in magnetic field," *Izv. Akad. Nauk SSSR, Mekh. Tverd. Tela*, No. 4, 32–34 (1984).
244. V. A. Samsonov, V. A. Eroshin, G. A. Konstantinov, and V. M. Makarshin, "Two model problems on body motion in a medium under streamline flow-around," in: *Scientific Report of Institute of Mechanics, Moscow State Univ.*, No. 3427 [in Russian], Institute of Mechanics, Moscow State Univ., Moscow (1987)
245. V. A. Samsonov, V. V. Kozlov, and M. V. Shamolin, "Reduction in problem of body motion in a medium under steamline flow-around," in: *Modern Problems of Mechanics and Technologies of Mashine Industry, All-Union Conf. (April 16–18, 1989). A Plenary Report* [in Russian], All-Union Institute for Scientific and Technical Information, Moscow (1989).
246. V. A. Samsonov, B. Ya. Lokshin, and V. A. Privalov, "Qualitative analysis," in: *Scientific Report of Institute of Mechanics, Moscow State Univ.*, No. 3245 [in Russian], Institute of Mechanics, Moscow State Univ., Moscow (1985).
247. V. A. Samsonov and M. V. Shamolin, "On body motion in a resisting medium," in: *Contemporary Problems of Mechanics and Technologies of Machine Industry, All-Union Conf., April 16–18, 1989. Abstracts of Reports* [in Russian], All-Union Institute for Scientific and Technical

Information, Moscow (1989), pp. 128–129.
248. V. A. Samsonov and M. V. Shamolin, ”To problem on body motion in a resisting medium,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 3, 51–54 (1989). MR1029730 (90k:70007)
249. V. A. Samsonov and M. V. Shamolin, ”A model problem of body motion in a medium with streamline flow-around,” *Scientific Report of Institute of Mechanics, Moscow State Univ.* [in Russian], No. 3969, Institute of Mechanics, Moscow State Univ., Moscow (1990).
250. V. A. Samsonov and M. V. Shamolin, ”A model problem of body motion in a medium with streamline flow-around,” in: *Nonlinear Oscillations of Mechanical Systems, Abstracts of Reports of II All-Union Conf., September, 1990*, Pt. 2 [in Russian], Gor’kii (1990), pp. 95–96.
251. V. A. Samsonov and M. V. Shamolin, ”To problem of body drag in a medium under streamline flow-around,” in: *Scientific Report of Institute of Mechanics, Moscow State Univ.*, No. 4141 [in Russian], Institute of Mechanics, Moscow State Univ., Moscow (1991).
252. V. A. Samsonov and M. V. Shamolin, ”On stability of a body under its drag in a resisting medium,” in: *VII Chetaev Conf. ”Analytical Mechanics, Stability, and Control of Motion,” June 10–13, 1997. Abstracts of Reports*, Kazan’ State Technical Univ., Kazan’ (1997), p. 24.
253. V. A. Samsonov, M. V. Shamolin, V. A. Eroshin, and V. M. Makarshin, ”Mathematical modelling in problem of body drag in a resisting medium under streamline flow-around,” in: *Scientific Report of Institute of Mechanics, Moscow State Univ.*, No. 4396 [in Russian], Moscow (1995).
254. G. Sansone, *Ordinary Differential Equations* [Russian translation], Inostr. Lit., Moscow (1954).
255. L. I. Sedov, *Mechanics of Continuous Media* [in Russian], Vols., 1, 2, Nauka, Moscow (1983, 1984).
256. H. Seifert and W. Threifall, *Topology* [Russian translation], Gostekhizdat, Moscow (1938).
257. N. Yu. Selivanova and M. V. Shamolin, ”Extended Cahn-Hilliard model and certain of its solutions,” in: *Materials of Voronezh All-Russian Conf. ”Pontryagin Readings—XVIII,” Voronezh, May, 2007*, Voronezh State Univ., Voronezh (2007), pp. 145–146.
258. J. L. Singh, *Classical Dynamics* [Russian translation], Fizmatgiz, Moscow (1963).
259. M. V. Shamolin, *Qualitative Analysis of a Model Problem of Body Motion in a Medium with Streamline Flow-Around* [in Russian], Candidate Dissertation, MGU, Moscow (1991).
260. M. V. Shamolin, *Qualitative Analysis of a Model Problem of Body Motion in a Medium with Streamline Flow-Around* [in Russian], Theses of Candidate Dissertation, MGU, Moscow (1991).
261. M. V. Shamolin, ”Closed trajectories of different topological types in problem of body motion in a medium with resistance,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 2, 52–56 (1992). MR1293705 (95d:34060)
262. M. V. Shamolin, ”To problem of body motion in a medium with resistance,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 1, 52–58 (1992). MR1214592 (93k:70028)
263. M. V. Shamolin, ”A new two-parameter family of phase portaits for problem of a body motion in a resisting medium,” in: *Modelling and Study of Stability of Systems, Sci. Conf., May 24–28, 1993. Abstracts of Reports*, Pt. 2 [in Russian], Znanie, Kiev (1993), pp. 62–63.
264. M. V. Shamolin, ”Applications of Poincaré topographical system methods and comparison systems in some concrete systems of differential equations,” *Vestn. Mosk. Univ. Ser. 1 Mat.*

Mekh., No. 2, 66–70 (1993). MR1223987 (94b:34060)
265. M. V. Shamolin, ”Classification of phase portraits in problem of body motion in a resisting medium in the presence of a linear damping moment,” *Prikl. Mat. Mekh.*, **57**, No. 4, 40–49 (1993). MR1258007 (94i:70027)
266. M. V. Shamolin, ”Existence and uniqueness of trajectories having infinitely distant points as limit sets for dynamical systems on a plane,” *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 1, 68–71 (1993). MR1293942 (95e:34036)
267. M. V. Shamolin, ”Global qualitative analysis of nonlinear systems on the problem of a body motion in a resisting medium,” in: *Fourth Colloquium on the Qualitative Theory of Differential Equations, Bolyai Institute, August 18–21, 1993*, Szeged, Hungary (1993), p. 54.
268. M. V. Shamolin, ”Relative structural stability of problem of body motion in a resisting medium,” in: *Mechanics and Its Applications, Sci. Conf., November 9–11, 1993, Abstracts of Reports*, Tashkent State Univ., Tashkent (1993), pp. 20–21.
269. M. V. Shamolin, ”A new two-parameter family of phase portraits in problem of a body motion in a medium,” *Dokl. Ross. Akad. Nauk*, **337**, No. 5, 611–614 (1994). MR1298329 (95g:70006)
270. M. V. Shamolin, ”On relative roughness of dynamical systems in problem of body motion in a medium under streamline flow around,” in: *Modelling and Study Stability of Systems, Sci. Conf., May 16–20, 1994. Abstract of Reports* [in Russian], Kiev (1994), pp. 144–145.
271. M. V. Shamolin, ”Relative structural stability on the problem of a body motion in a resisting medium,” in: *ICM’94, Abstract of Short Communications, Zurich, 3–11 August, 1994*, Zurich, Switzerland (1994), p. 207.
272. M. V. Shamolin, ”A new two-parameter family of phase portraits with limit cycles in rigid body dynamics interacting with a medium,” in: *Modelling and Study of Stability of Systems, Sci. Conf., May 15–19, 1995. Abstracts of Reports (Study of Systems)* [in Russian], Kiev (1995), p. 125.
273. M. V. Shamolin, ”New two-parameter families of the phase patterns on the problem of a body motion in a resisting medium,” in: *ICIAM’95, Book of Abstracts. Hamburg, 3–7 July, 1995*, Hamburg, Germany (1995), p. 436.
274. M. V. Shamolin, ”On relative structural stability of dynamical systems in problem of body motion in a resisting medium,” the abstract of a talk at the Chebyshev Readings, *Vestn. Mosk. Univ. Ser. 1 Mat Mekh.*, No. 6, 17 (1995). MR1809236
275. M. V. Shamolin, ”Poisson-stable and dense orbits in rigid body dynamics,” in: *3rd Experimental Chaos Conf., Advance Program. Edinburgh, Scotland, August 21–23, 1995*, Edinburgh, Scotland (1995), p. 114.
276. M. V. Shamolin, ”Qualitative methods to the dynamic model of interaction of a rigid body with a resisting medium and new two-parametric families of the phase portraits,” in: *DynDays’95 (Sixteenth Annual Informal Workshop), Program and Abstracts. Lyon, June 28-July 1, 1995*, Lyon, France (1995), p. 185.
277. M. V. Shamolin, ”Relative structural stability of dynamical systems for problem of body motion in a medium,” in: *Analytical, Numerical, and Experimental Methods in Mechanics. A Collection of Scientific Works* [in Russian], Izd. Mosk. Univ., Moscow (1995), pp. 14–19. MR1809236
278. M. V. Shamolin, ”Structural optimization of the controlled rigid motion in a resisting medium,”

in: *WCSMO-1, Extended Abstracts. Posters. Goslar, May 28-June 2, 1995*, Goslar, Germany (1995), p. 18–19.
279. M. V. Shamolin, "A list of integrals of dynamical equations in spatial problem of body motion in a resisting medium," in: *Modelling and Study of Stability of Systems, Sci. Conf., May 20–24, 1996. Abstracts of Reports (Study of Systems)* [in Russian], Kiev (1996), p. 142.
280. M. V. Shamolin, "Definition of relative roughness and two-parameter family of phase portraits in rigid body dynamics," *Usp. Mat. Nauk*, **51**, No. 1, 175–176 (1996). MR1392692 (97f:70010)
281. M. V. Shamolin, "Introduction to problem of body drag in a resisting medium and a new two-parameter family of phase portraits," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 4, 57–69 (1996). MR1644665 (99e:70027)
282. M. V. Shamolin, "Introduction to spatial dynamics of rigid body motion in resisting medium," in: *Materials of Int. Conf. and Chebyshev Readings Devoted to the 175th Anniversary of P. L. Chebyshev, Moscow, May 14–19, 1996*, Vol. 2 [in Russian], Izd. Mosk. Univ., Moscow (1996), pp. 371–373.
283. M. V. Shamolin, "On a certain integrable case in dynamics of spatial body motion in a resisting medium," in: *II Symposium in Classical and Celestial Mechanics. Abstracts of Reports. Velikie Luki, August 23–28, 1996* [in Russian], Moscow-Velikie Luki (1996), pp. 91–92.
284. M. V. Shamolin, "Periodic and Poisson stable trajectories in problem of body motion in a resisting medium," *Izv. Ross. Akad. Nauk, Mekh. Tverd. Tela*, No. 2, 55–63 (1996).
285. M. V. Shamolin, "Qualitative methods in dynamics of a rigid body interacting with a medium," in: *II Siberian Congress in Applied and Industrial Mathematics, Novosibirsk, June 25–30, 1996. Abstracts of Reports*, Pt. III [in Russian], Novosibirsk (1996), p. 267.
286. M. V. Shamolin, "Qualitative methods in interacting with the medium rigid body dynamics," in: *Abstracts of GAMM Wissenschaftliche Jahrestagung'96, 27.-31. May, 1996*, Czech Rep., Karls-Universität Prag., Prague (1996), pp. 129–130.
287. M. V. Shamolin, "Qualitative methods in interacting with the medium rigid body dynamics," in: *Abstracts of XIXth ICTAM, Kyoto, Japan, August 25–31, 1996*, Kyoto, Japan (1996), p. 285.
288. M. V. Shamolin, "Relative structural stability and relative structural instability of different degrees in topological dynamics," in: *Abstracts of Int. Topological Conf. Dedicated to P. S. Alexandroff's*
289. *100th Birthday "Topology and Applications," Moscow, May 27–31, 1996*, Fazis, Moscow (1996), pp. 207–208.
290. M. V. Shamolin, "Spatial Poincaré topographical systems and comparison systems," in: *Abstract of Reports of Math. Conf. "Erugin Readings," Brest, May 14–16, 1996* [in Russian], Brest (1996), p. 107. MR1479402 (99a:34089)
291. M. V. Shamolin, "Topographical Poincaré systems in many-dimensional spaces," in: *Fifth Colloquium on the Qualitative Theory of Differential Equations, Bolyai Institute, Regional Committee of the Hungarian Academy of Sciences, July 29-August 2, 1996*, Szeged, Hungary (1996), p. 45.
292. M. V. Shamolin, "Variety of types of phase portraits in dynamics of a rigid body interacting with a resisting medium," *Dokl. Ross. Akad. Nauk*, **349**, No. 2, 193–197 (1996). MR1440994 (98b:70009)

293. M. V. Shamolin, ”Classical problem of a three-dimensional motion of a pendulum in a jet flow,” in: *3rd EUROMECH Solid Mechanics Conf., Book of Abstracts, Stockholm, Sweden, August 18–22, 1997*, Royal Inst. of Technology, Stockholm, Sweden (1997), p. 204.
294. M. V. Shamolin, ”Families of three-dimensional phase portraits in dynamics of a rigid body,” in: *EQUADIFF 9, Abstracts, Enlarged Abstracts, Brno, Czech Rep., August 25–29, 1997*, Masaryk Univ., Brno, Czech Rep. (1997), p. 76.
295. M. V. Shamolin, ”Jacobi integrability of problem of a spatial pendulum placed in over-running medium flow,” in: *Modelling and Investigation of System Stability. Sci. Conf., May 19–23, 1997. Abstracts of Reports* [in Russian], Kiev (1997), p. 143.
296. M. V. Shamolin, ”Mathematical modelling of dynamics of a spatial pendulum flowing around by a medium,” in *Proc. of VII Int. Symposium ”Methods of Discrete Singularities in Problems of Mathematical Physics,” Feodociya, June 26–29, 1997* [in Russian], Kherson State Technical Univ., Kherson (1997), pp. 153–154.
297. M. V. Shamolin, ”On an integrable case in spatial dynamics of a rigid body interacting with a medium,” *Izv. Ross. Akad. Nauk, Mekh. Tverd. Tela*, No. 2, 65–68 (1997).
298. M. V. Shamolin, ”Partial stabilization of body rotational motions in a medium under a free drag,” *Abstracts of Reports of All-Russian Conf. with Int. Participation ”Problems of Celestial Mechanics,” St. Petersburg, June 3–6, 1997* [in Russian], Institute of Theoretical Astronomy, Russian Academy of Sciences, St. Petersburg (1997), pp. 183–184.
299. M. V. Shamolin, ”Qualitative methods in dynamics of a rigid body interacting with a medium,” in: *YSTM’96: ”Young People, the Third Millenium,” Proc. of Int. Congress (Ser. Professional)* [in Russian], Vol. 2, NTA ”APFN,” Moscow (1997), pp. 1–4.
300. M. V. Shamolin, ”Spatial dynamics of a rigid body interacting with a medium,” Workshop in Mechanics of Systems and Problems of Motion Control and Navigation, *Izv. Ross. Akad. Nauk, Mekh. Tverd. Tela*, No. 4, 174 (1997).
301. M. V. Shamolin, ”Spatial Poincaré topographical systems and comparison systems,” *Usp. Mat. Nauk*, **52**, No. 3, 177–178 (1997). MR1479402 (99a:34089)
302. M. V. Shamolin, ”Three-dimensional structural optimization of controlled rigid motion in a resisting medium,” in: *Proc. of WCSMO-2, Zakopane, Poland, May 26–30, 1997*, Zakopane, Poland (1997), pp. 387–392.
303. M. V. Shamolin, ”Three-dimensional structural optimization of controlled rigid motion in a resisting medium,” in: *WCSMO-2, Extended Abstracts, Zakopane, Poland, May 26–30, 1997*, Zakopane, Poland (1997), pp. 276–277.
304. M. V. Shamolin, ”Absolute and relative structural stability in spatial dynamics of a rigid body interacting with a medium,” in: *Proc. of Int. Conf. ”Mathematics in Industry,” ICIM-98, Taganrog, June 29-July 3, 1998* [in Russian], Taganrog State Pedagogical Inst., Taganrog (1998), pp. 332–333.
305. M. V. Shamolin, ”Families of portraits with limit cycles in plane dynamics of a rigid body interacting with a medium,” *Izv. Ross. Akad. Nauk, Mekh. Tverd. Tela*, No. 6, 29–37 (1998).
306. M. V. Shamolin, ”Family of three-dimensional phase portraits in spatial dynamics of a rigid body interacting with a medium,” in: *III Int. Symposium in Classical and Celestial Mechanics, August 23–27, 1998, Velikie Luki. Abstracts of Reports* [in Russian]. Computational Center of

Russian Academy of Sciences, Moscow-Velikie Luki (1998), pp. 165–167.
307. M. V. Shamolin, ”Lyapunov functions method and many-dimensional topographical systems of Poincaré in rigid body dynamics,” in: *Abstract of Reports of IV Crimenian Int. Math. School ”Lyapunov Function Method and Its Applications,” Crimea, Alushta, September 5–12*, Simpheropol’ State Univ., Simpheropol’ (1998), p. 80.
308. M. V. Shamolin, ”Many-dimensional topographical Poincaré systems in rigid body dynamics,” in: *Abstracts of GAMM Wissenschaftliche Jahrestagung’98, 6.-9. April, 1998*, Universität Bremen, Bremen, Germany (1998), p. 128.
309. M. V. Shamolin, ”Methods of nonlinear analysis in dynamics of a rigid body interacting with a medium,” in: *Abstracts of Reports of Int. Congress ”Nonlinear Analysis and Its Applications,” Moscow, September 1–5, 1988* [in Russian], Moscow (1998), p. 131.
310. M. V. Shamolin, ”Methods of nonlinear analysis in dynamics of a rigid body interacting with a medium,” in: *CD-Proc. of the Congress ”Nonlinear Analysis and Its Applications,” Moscow, Russia, September 1–5, 1998*, Moscow (1999), pp. 497–508.
311. M. V. Shamolin, ”New two-parametric families of the phase portraits in three-dimensional rigid body dynamics,” in: *Int. Conf. Devoted to the 90th Anniversary of L. S. Pontryagin, Moscow, August 31-September 6, 1998, Abstract of Reports, Differntial Equations*, Izd. Mosk. Univ., Moscow (1998), pp. 97–99.
312. M. V. Shamolin, ”On integrability in transcendental functions,” *Usp. Mat. Nauk*, **53**, No. 3, 209–210 (1998). MR1657632 (99h:34006)
313. M. V. Shamolin, ”Qualitative and numerical methods in some problems of spatial dynamics of a rigid body interacting with a medium,” in: *Abstracts of Reports of 5th Int. Conf.-Workshop ”Engineering-Physical Problems of New Tehnics,” Moscow, May 19–22, 1998* [in Russian], Moscow State Technical Univ., Moscow (1998), pp. 154–155.
314. M. V. Shamolin, ”Some classical problems in three-dimensional dynamics of a rigid body interacting with a medium,” in: *Proc. of ICTACEM’98, Kharagpur, India, December 1–5, 1998*, Aerospace Engineering Dep., Indian Inst. of Technology, Kharagpur, India (1998), p. 11.
315. M. V. Shamolin, ”Some problems of spatial dynamics of a rigid body interactng with a medium under quasi-stationarity conditions,” in: *Abstracts of Reports of All-Russian Sci.-Tech. Conf. of Young Scientists ”Modern Problems of Aero-Cosmos Science,” Zhukovskii, May 27–29, 1998* [in Russian], Central Aero-Hydrodynamical Inst., Moscow (1998), pp. 89–90.
316. M. V. Shamolin, ”Certain classes of partial solutions in dynamics of a rigid body interacting with a medium,” *Izv. Ross. Akad. Nauk, Mekh. Tverd. Tela*, No. 2, 178–189 (1999).
317. M. V. Shamolin, ”Families of long-period trajectories in spatial dynamics of a rigid body,” in: *Modelling and Study of Stability of Systems, Sci. Conf., May 25–29 1999. Abstracts of Reports* [in Russian], Kiev (1999), p. 60.
318. M. V. Shamolin, ”Integrability in terms of transcendental functions in rigid body dynamics,” in: *Book of Abstracts of GAMM Annual Meeting, April 12–16, 1999, Metz, France*, Université de Metz, Metz, France (1999), p. 144.
319. M. V. Shamolin, ”Long-periodic trajectories in rigid body dynamics,” in: *Sixth Colloquium on the Qualitative Theory of Differential Equations, Bolyai Institute, Regional Committee of the*

Hungarian Academy of Sciences, August 10–14, 1999, Szeged, Hungary (1999), p. 47.
320. M. V. Shamolin, "Mathematical modelling in 3D dynamics of a rigid interacting with a medium," in: *Book of Abstracts of the Second Int. Conf. "Tools for Mathematical Modelling," Saint-Petersburg, Russia, 14–19 June, 1999*, Saint-Petersburg State Tech. Univ., Saint-Petersburg (1999), pp. 122–123.
321. M. V. Shamolin, "Methods of analysis of a deceleration of a rigid in 3D medium," in: *Contributed Abstracts of 3rd ENOC, Copenghagen (Lyngby), Denmark, August 8–12, 1999*, Tech. Univ. of Denmark, Copenghagen (1999).
322. M. V. Shamolin, "New families of the nonequivalent phase portraits in 3D rigid body dynamics," in: *Abstracts of Second Congress ISAAC 1999, Fukuoka, Japan, August 16–21, 1999*, Fukuoka Ins. of Tech., Fukuoka (1999), pp. 205–206.
323. M. V. Shamolin, "New Jacobi integrable cases in dynamics of a rigid body interacting with a medium," *Dokl. Ross. Akad. Nauk*, **364**, No. 5, 627–629 (1999). MR1702618 (2000k:70008)
324. M. V. Shamolin, "Nonlinear dynamical effects in spatial body drag in a resisting medium," in: *Abstracts of Reports of III Int. Conf. "Chkalov Readings, Engineering-Physical Problems of Aviation and Cosmos Technics" (June 1–4, 1999)* [in Russian], EATK GA, Egor'evsk (1999), pp. 257–258.
325. M. V. Shamolin, "On roughness of dissipative systems and relative roughness and nonroughness of variable dissipation systems," *Usp. Mat. Nauk*, **54**, No. 5, 181–182 (1999). MR1741681 (2000j:37021)
326. M. V. Shamolin, "Properties of integrability of systems in terms of transcendental functions," in: *Final Progr. and Abstracts of Fifth SIAM Conf. on Appl. of Dynamic. Syst., May 23–27, 1999, Snowbird, Utah, USA*, SIAM (1999), p. 60.
327. M. V. Shamolin, "Some properties of transcendental integrable dynamical systems," in: *Book of Abstracts of EQUADIFF 10, Berlin, August 1–7, 1999*, Free Univ. of Berlin, Berlin (1999), pp. 286–287.
328. M. V. Shamolin, "Structural stability in 3D dynamics of a rigid body," in: *WCSMO-3, Short Paper Proc., Buffalo, NY, May 17–21, 1999*, Vol. 2, Buffalo (1999), pp. 475–477.
329. M. V. Shamolin, "Structural stability in 3D dynamics of a rigid body," in: *CD-Proc. of WCSMO-3, Buffalo, NY, May 17–21, 1999*, Buffalo (1999), p. 6.
330. M. V. Shamolin, "A new family of phase portraits in spatial dynamics of a rigid body interacting with a medium," *Dokl. Ross. Akad. Nauk*, **371**, No. 4, 480–483 (2000). MR1776307 (2001k:70006)
331. M. V. Shamolin, "About interaction of a rigid body with a resisting medium under an assumption of a jet flow," in: *Book of Abstracts II (General sessions) of 4th EUROMECH Solid. Mech. Conf., Metz, France (June 26–30, 2000)*, Univ. of Metz (2000), p. 703.
332. M. V. Shamolin, "Comparison of certain integrability cases from two-, three-, and four-dimensional dynamics of a rigid body interacting with a medium," in: *Abstracts of Reports of V Crimeanian Int. Math. School "Lyapunov Function Method and Its Application," (MLF-2000), Crimea, Alushta, September 5–13, 2000* [in Russian], Simpheropol' (2000), p. 169.
333. M. V. Shamolin, "Integrability and nonintegrability in terms of transcendental functions," in: *CD-Abstracts of 3rd ECM (Poster sessions), Barcelona, Spain, June 10–14, 2000*, Poster No.

36.
334. M. V. Shamolin, ”Jacobi integrability of problem of four-dimensional body motion in a resisting medium,” in: *Abstracts of Reports of Int. Conf. in Differential Equations and Dynamical Systems, Suzdal’, August 21–26, 2000* [in Russian], Vladimir State Univ., Vladimir (2000), pp. 196–197.
335. M. V. Shamolin, ”Jacobi integrability in problem of four-dimensional rigid body motion in a resisting medium,” *Dokl. Ross. Akad. Nauk*, **375**, No. 3, 343–346 (2000). MR1833828 (2002c:70005)
336. M. V. Shamolin, ”Many-dimensional Poincaré systems and transcendental integrability,” in: IV Siberian Congress in Applied and Industrial Mathematics, Novosibirsk, June 26-July 1, 2000. Abstracts of Reports, Pt. I [in Russian], Novosibirsk, Institute of Mathematics (2000), pp. 25–26.
337. M. V. Shamolin, ”Mathematical modelling of interaction of a rigid body with a medium and new cases of integrability,” In: *Book of Abstracts of ECCOMAS 2000, Barcelona, Spain, 11–14 September*, Barcelona (2000), p. 495.
338. M. V. Shamolin, ”Mathematical modelling of interaction of a rigid body with a medium and new cases of integrability,” in: *CD-Proc. of ECCOMAS 2000, Barcelona, Spain, 11–14 September*, Barcelona (2000), p. 11.
339. M. V. Shamolin, ”Methods of analysis of dynamics of a rigid body interacting with a medium,” in: *Book of Abstracts of Annual Sci. Conf. GAMM 2000 at the Univ. of Göttingen, 2–7 April, 2000*, Univ. of Göttingen (2000), p. 144.
340. M. V. Shamolin, ”New families of many-dimensional phase portraits in dynamics of a rigid body interacting with a medium,” in: *Book of Abstracts of 16th IMACS World Congress 2000, Lausanne, Switzerland, August 21–25, 2000*, EPFL (2000), p. 283.
341. M. V. Shamolin, ”New families of many-dimensional phase portraits in dynamics of a rigid body interacting with a medium,” in: *CD-Proc. of 16th IMACS World Congress 2000, Lausanne, Switzerland, August 21–25, 2000*, EPFL (2000).
342. M. V. Shamolin, ”On a certain case of Jacobi integrability in dynamics of a four-dimensional rigid body interacting with a medium,” in: *Abstracts of Reports of Int. Conf. in Differential and Integral Equations, Odessa, September 12–14, 2000* [in Russian], AstroPrint, Odessa (2000), pp. 294–295.
343. M. V. Shamolin, ”On limit sets of differential equations near singular points,” *Usp. Mat. Nauk*, **55**, No. 3, 187–188 (2000). MR1777365 (2002d:34049)
344. M. V. Shamolin, ”On roughness of disspative systems and relative roughness of variable dissipation systems,” the abstract of a talk at the Workshop in Vector and Tensor Analysis Named after P. K. Rashevskii, *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 2, 63 (2000).
345. M. V. Shamolin, ”Problem of four-dimensional body motion in a resisting medium and one case of integrability,” in: *Book of Abstracts of the Third Int. Conf. ”Differential Equations and Applications,” St. Petersburg, Russia, June 12–17, 2000* [in Russian], St. Petersburg State Univ., St. Petersburg (2000), p. 198.
346. M. V. Shamolin, ”Comparison of some cases of integrability in dynamics of a rigid body interacting with a medium,” in: *Book of Abstracts of Annual Sci. Conf. GAMM 2001, ETH*

Zurich, 12–15 February, 2001, ETH, Zurich (2001), p. 132.
347. M. V. Shamolin, "Complete integrability of equations for motion of a spatial pendulum in overrunning medium flow," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 5, 22–28 (2001). MR1868040 (2002f:70005)
348. M. V. Shamolin, "Diagnosis problem as the main problem of general differential diagnosis problem," in: *Book of Abstracts of the Third Int. Conf. "Tools for Mathematical Modelling," St. Petersburg, Russia, June 18–23, 2001* [in Russian], St. Petersburg State Technical Univ., St. Petersburg (2001), p. 121.
349. M. V. Shamolin, "Integrability cases of equations for spatial dynamics of a rigid body," *Prikl. Mekh.*, **37**, No. 6, 74–82 (2001). MR1872149 (2002i:70006)
350. M. V. Shamolin, "Integrability of a problem of four-dimensional rigid body in a resisting medium," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," *Fund. Prikl. Mat.*, **7**, No. 1, 309 (2001).
351. M. V. Shamolin, "New integrable cases in dynamics of a four-dimensional rigid body interacting with a medium," in: *Abstracts of Reports of Sci. Conf., May 22–25, 2001* [in Russian], Kiev (2001), p. 344.
352. M. V. Shamolin, "New Jacobi integrable cases in dynamics of two-, three-, and four-dimensional rigid body interacting with a meduium," in: *Abstracts of Reports of VIII All-Russian Congress in Theoretical and Applied Mechanics, Perm', August 23–29, 2001* [in Russian], Ural Department of the Russian Academy of Sciences, Ekaterinburg (2001), pp. 599–600.
353. M. V. Shamolin, "On stability of motion of a body twisted around its longitudinal axis in a resisting medium," *Izv. Ross. Akad. Nauk, Mekh. Tverd. Tela*, No. 1, 189–193 (2001).
354. M. V. Shamolin, "Pattern recognition in the model of the interaction of a rigid body with a resisting medium," in: *Col. of Abstracts of First SIAM-EMS Conf. "Applied Mathematics in Our Changing World," Berlin, Germany, September 2–6, 2001*, Springer, Birkhäuser (2001), p. 66.
355. M. V. Shamolin, "Variety of types of phase portraits in dynamics of a rigid body interacting with a medium," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," *Fund. Prikl. Mat.*, **7**, No. 1, 302–303 (2001).
356. M. V. Shamolin, "Dynamical systems with variable dissipation in 3D dynamics of a rigid body interacting with a medium," in: *Book of Abstracts of 4th ENOC, Moscow, Russia, August 19–23, 2002*, Inst. Probl. Mech. Russ. Acad. Sci., Moscow (2002), p. 109.
357. M. V. Shamolin, "Foundations in differential and topological diagnostics," in: *Book of Abstracts of Annual Sci. Conf. GAMM 2002, Univ. of Augsburg, March 25–28, 2002*, Univ. of Augsburg (2002), p. 154.
358. M. V. Shamolin, "Methods of analysis of dynamics of a 2D- 3D-, or 4D-rigid body with a medium," in: *Abstracts, Short Communications, Poster Sessions of ICM-2002, Beijing, August 20–28, 2002*, Higher Education Press, Beijing, China (2002), p. 268.
359. M. V. Shamolin, "New integrable cases in dynamics of a two-, three-, and four-dimensional rigid body interacting with a medium," in: *Abstracts of Reports of Int. Conf. in Differential Equations and Dynamical Systems, Suzdal', July 1–6, 2002* [in Russian], Vladimir State Univ.,

Vladimir (2002), pp. 142–144.
360. M. V. Shamolin, ”On integrability of certain classes of nonconservative systems,” *Usp. Mat. Nauk*, **57**, No. 1, 169–170 (2002). MR1914556 (2003g:34019)
361. M. V. Shamolin, ”Some questions of the qualitative theory of ordinary differential equations and dynamics of a rigid body interacting with a medium,” *J. Math. Sci.*, **110**, No. 2, 2526–2555 (2002). MR1919087 (2004j:37161)
362. M. V. Shamolin, ”Foundations of differential and topological diagnostics,” *J. Math. Sci.*, **114**, No. 1, 976–1024 (2003). MR1965084 (2004d:93033)
363. M. V. Shamolin, ”Global structural stability in dynamics of a rigid body interacting with a medium,” in: *5th ICIAM, Sydney, Australia, 7–11 July, 2003*, Univ. of Technology, Sydney (2003), p. 306.
364. M. V. Shamolin, ”Integrability and nonintegrability in terms of transcendental functions,” in: *Book of Abstracts of Annual Sci. Conf. GAMM 2003, Abano Terme-Padua, Italy, 24–28 March, 2003*, Univ. of Padua (2003), p. 77.
365. M. V. Shamolin, ”Integrability in transcendental functions in rigid body dynamics,” in: *Abstracts of Reports of Sci. Conf. ”Lomonosov Readings,” Sec. Mechanics, April 17–27, 2003, Moscow, M. V. Lomonosov Moscow State Univ.* [in Russian], MGU, Noscow (2003), p. 130.
366. M. V. Shamolin, ”New integrable cases and families of portraits in the plane and spatial dynamics of a rigid body interacting with a medium,” *J. Math. Sci.*, **114**, No. 1, 919–975 (2003). MR1965083 (2004d:70008)
367. M. V. Shamolin, ”On a certain spatial problem of rigid body motion in a resisting medium,” in: *Abstracts of Reports of Int. Sci. Conf. ”Third Polyakhov Readings,” St. Petersburg, February 4–6, 2003* [in Russian], NIIKh St. Petersburg Univ., St. Petersburg (2003), pp. 170–171.
368. M. V. Shamolin, ”On integrability of nonconservative dynamical systems in transcendental functions,” in: *Modelling and Study of Stability of Systems, Sci. Conf., May 27–30, 2003, Abstracts of Reports* [in Russian], Kiev (2003), p. 277.
369. M. V. Shamolin, ”Some questions of differential and topological diagnostics,” in: *Book of Abstracts of 5th European Solid Mech. Conf. (ESMC-5), Thessaloniki, Greece, August 17–22, 2003*, Aristotle Univ. Thes. (AUT), European Mech. Sc. (EUROMECH) (2003), p. 301.
370. M. V. Shamolin, ”Classes of variable dissipation systems with nonzero mean in the dynamics of a rigid body,” *J. Math. Sci.*, **122**, No. 1, 2841–2915 (2004). MR2082898 (2005j:70014)
371. M. V. Shamolin, ”Geometric representation of motion in a certain problem of body interaction with a medium,” *Prikl. Mekh.*, **40**, No. 4, 137–144 (2004). MR2131714 (2005m:70050)
372. M. V. Shamolin, ”Integrability of nonconservative systems in elementary functions,” in: *X Math. Int. Conf. Named after Academician M. Kravchuk, May 13–15, 2004, Kiev* [in Russian], Kiev (2004), p. 279.
373. M. V. Shamolin, *Methods for Analysis of Classes of Nonconservative Systems in Dynamics of a Rigid Body Interacting with a Medium* [in Russian], Doctoral Dissertation, MGU, Moscow (2004).
374. M. V. Shamolin, *Methods for Analysis of Classes of Nonconservative Systems in Dynamics of a Rigid Body Interacting with a Medium* [in Russian], Theses of Doctoral Dissertation, MGU, Moscow (2004).

375. M. V. Shamolin, "Some cases of integrability in dynamics of a rigid body interacting with a resisting medium," in: *Abstracts of Reports of Int. Conf. in Differential Equations and Dynamical Systems, Suzdal', July 5–10, 2004*, Vladimir State Univ., Vladimir (2004), pp. 296–298.
376. M. V. Shamolin, *Some Problems of Differential and Topological Diagnosis* [in Russian], Ekzamen, Moscow (2004).
377. M. V. Shamolin, "A case of complete integrability in spatial dynamics of a rigid body interacting with a medium taking account of rotational derivatives of force moment in angular velocity," *Dokl. Ross. Akad. Nauk*, **403**, No. 4, 482–485 (2005). MR2216035 (2006m:70012)
378. M. V. Shamolin, "Cases of complete integrability in dynamics of a four-dimensional rigid body interacting with a medium," in: *Abstracts of Reports of Int. Conf. "Functional Spaces, Approximation Theory, and Nonlinear Analysis" Devoted to the 100th Anniversary of A. M. Nikol'skii, Moscow, May 23–29, 2005* [in Russian], V. A. Steklov Math. Inst. of the Russian Academy of Sciences, Moscow (2005), p. 244.
379. M. V. Shamolin, "Comparison of Jacobi integrable cases of plane and spatial body motions in a medium under streamline flow-around." *Prikl. Mat. Mekh.*, **69**, No. 6, 1003–1010 (2005). MR2252203 (2007c:70009)
380. M. V. Shamolin, "Integrability in transcendental functions in rigid body dynamics," in: *Math. Conf. "Modern Problems of Applied Mathematics and Mathematical Modelling," Voronezh, December 12–17, 2005* [in Russian], Voronezh State Acad., Voronezh (2005), p. 240.
381. M. V. Shamolin, "Mathematical model of interaction of a rigid body with a resisting medium in a jet flow," in: *Abstracts. Pt. 1. 76 Annual Sci. Conf. (GAMM), Luxembourg, March 28-April 1, 2005*, Univ. du Luxembourg (2005), pp. 94–95.
382. M. V. Shamolin, "On a certain integrable case in dynamics on $\mathrm{so}(4) \times \mathbb{R}^4$," in: *Abstracts of Reports of All-Russian Conf. "Differential Equations and Their Applications," (SamDif-2005), Samara, June 27-July 2, 2005* [in Russian], Univers-Grupp, Samara (2005), pp. 97–98.
383. M. V. Shamolin, "On a certain integrable case of equations of dynamics in $\mathrm{so}(4) \times \mathbb{R}^4$," *Usp. Mat. Nauk*, **60**, No. 6, 233–234 (2005). MR2225204 (2007a:70009)
384. M. V. Shamolin, "On body motion in a resisting medium taking account of rotational derivatives of aerodynamic force moment in angular velocity," in: *Abstracts of Reports of Sci. Conf. "Lomonosov Readings-2005," Sec. Mechanics, April, 2005, Moscow, M. V. Lomonosov Moscow State Univ.* [in Russian], MGU, Moscow (2005), p. 182.
385. M. V. Shamolin, "On rigid body motion in a resisting medium taking account of rotational derivatives of areodynamical force moment in angular velocity," in: *Modelling and Studying of Systems, Sci. Conf., May 23–25, 2005. Abstracts of Reports* [in Russian], Kiev (2005), p. 351.
386. M. V. Shamolin, "Some cases of integrability in 3D dynamics of a rigid body interacting with a medium," in: *Book of Abstracts. IMA Int. Conf. "Recent Advances in Nonlinear Mechanics," Aberdeen, Scotland, August 30-September 1, 2005*, Aberdeen (2005), p. 112.
387. M. V. Shamolin, "Structural stable vector fields in rigid body dynamics," in: *Abstracts of 8th Conf. on Dynamical Systems (Theory and Applications) (DSTA 2005), Lodz, Poland, December 12–15, 2005*, Tech. Univ. Lodz (2005), p. 78.
388. M. V. Shamolin, "Structural stable vector fields in rigid body dynamics," in: *Proc. of 8th Conf. on Dynamical Systems (Theory and Applications) (DSTA 2005), Lodz, Poland, December 12–*

15, 2005, Vol. 1, Tech. Univ. Lodz (2005), pp. 429–436.
389. M. V. Shamolin, "Variable dissipation dynamical systems in dynamics of a rigid body interacting with a medium," in: *Differential Equations and Computer Algebra Tools, Materials of Int. Conf., Brest, October 5–8, 2005*, Pt. 1 [in Russian], BGPU, Minsk (2005), pp. 231–233.
390. M. V. Shamolin, "Almost conservative systems in dynamics of a rigid body," in: *Book of Abstracts, 77th Annual Meeting of GAMM, March 27–31, 2006, Technische Univ. Berlin*, Technische Univ. Berlin (2006), p. 74.
391. M. V. Shamolin, "Model problem of body motion in a resisting medium taking account of dependence of resistance force on angular velocity," in: *Scientifuc Report of Institute of Mechanics, Moscow State Univ.* [in Russian], No. 4818, Institute of Mechanics, Moscow State Univ., Moscow (2006), p. 44.
392. M. V. Shamolin, "On a case of complete integrability in four-dimensional rigid body dynamics," *Abstracts of Reports of Int. Conf. in Differential Equations and Dynamical Systems, Vladimir, July 10–15, 2006* [in Russian], Vladimir State Univ., Vladimir (2006), pp. 226–228.
393. M. V. Shamolin, "On trajectories of characteristic points of a rigid body moving in a medium," in: *Int. Conf. "Fifth Okunev Readings," St. Petersburg, June 26–30, 2006. Abstracts of Reports* [in Russian], Balt. State Tech. Univ., St. Petersburg (2006), p. 34.
394. M. V. Shamolin, "Spatial problem on rigid body motion in a resistingmedium," in: *VIII Crimeanian Int. Math. School "Lyapunov Function Method and Its Applications," Abstracts of Reports, Alushta, September 10–17, 2006, Tavriya National Univ.* [in Russian], DiAiPi, Simpheropol' (2006), p. 184.
395. M. V. Shamolin, "To problem on rigid body spatial drag in a resisting medium," *Izv. Ross. Akad. Nauk, Mekh. Tverd. Tela*, **3**, 45–57 (2006).
396. M. V. Shamolin, "To spatial problem of rigid body interaction with a resisting medium," in: *Abstracts of Reports of IX All-Russian Congress in Theoretical and Applied Mechanics, Nizhnii Novgorod, August 22 28, 2006*, Vol. I [in Russian], N. I. Lobachevskii Nizhegodskii State Univ., Niznii Novgorod (2006), p. 120.
397. M. V. Shamolin, "Variable dissipation systems in dynamics of a rigid body interacting with a medium," *Fourth Polyakhov Readings, Abstracts of Reports of Int. Sci. Conf. in Mechanics, St. Petersburg, February 7–10, 2006* [in Russian], VVM, St. Petersburg (2006), p. 86.
398. M. V. Shamolin, "4D rigid body and some cases of integrability," in: *Abstracts of ICIAM07, Zurich, Switzerland, June 16–20, 2007*, ETH, Zurich (2007), p. 311.
399. M. V. Shamolin, "A case of complete integrability in dynamics on a tangent bundle of two-dimensional sphere," *Usp. Mat. Nauk*, **62**, No. 5, 169–170 (2007). MR2373767 (2008i:37121)
400. M. V. Shamolin, "Case of complete integrability in dynamics of a four-dimensional rigid body in nonconcervative force field," in: *"Nonlinear Dynamical Analysis-2007," Abstracts of Reports of Int. Congress, St. Petersburg, June 4–8, 2007* [in Russian], St. Petersburg State Univ., St. Petersburg (2007), p. 178.
401. M. V. Shamolin, "Cases of complete integrability in dynamics of a rigid body interacting with a medium," *Abstracts of Reports of All-Russian Conf. "Modern Problems of Continuous Medium Mechanics" Devoted to Memory of L. I. Sedov in Connection with His 100th Anniversary, Moscow, November 12–14, 2007* [in Russian], MIAN, Moscow (2007), pp. 166–167.

402. M. V. Shamolin, "Cases of complete integrability in dynamics of a four-dimensional rigid body in a nonconservative force field," in: *Abstract of Reports of Int. Conf. "Analysis and Singularities," Devoted to 70th Anniversary of V. I. Arnol'd, August 20–24, 2007, Moscow* [in Russian], MIAN, Moscow (2007), pp. 110–112.
403. M. V. Shamolin, "Cases of complete integrability in elementary functions of certain classes of nonconservative dynamical systems," in: *Abstracts of Reports of Int. Conf. "Classical Problems of Rigid Body Dynamics," June 9–13, 2007* [in Russian], Institute of Applied Mathematics and Mechanics, National Academy of Sciences of Ukraine, Donetsk (2007), pp. 81–82.
404. M. V. Shamolin, "Complete integrability of equations of motion for a spatial pendulum in medium flow taking account of rotational derivatives of moments of its action force," *Izv. Ross. Akad. Nauk, Mekh. Tverd. Tela*, **3**, 187–192 (2007).
405. M. V. Shamolin, "Integrability in elementary functions of variable dissipation systems," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 38.
406. M. V. Shamolin, "Integrability of problem of four-dimensional rigid body motion in a resisting medium," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 21.
407. M. V. Shamolin, "Integrability of strongly nonconservative systems in transcendental elementary functions," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 40.
408. M. V. Shamolin, *Methods of Analysis of Variable Dissipation Dynamical Systems in Rigid Body Dynamics* [in Russian], Ekzamen, Moscow (2007).
409. M. V. Shamolin, "New integrable cases in dynamics of a four-dimensional rigid body interacting with a medium," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 27.
410. M. V. Shamolir, "On account of rotational derivatives of a force moment of action of the medium in angular velocity of the rigid body on body motion," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 44.
411. M. V. Shamolin, "On account of rotational derivatives of aerodynamical force moment on body motion in a resisting medium," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR

Academy of Sciences, Moscow (2007), p. 26.
412. M. V. Shamolin, ”On integrability in elementary functions of certain classes of nonconscrvative dynamical systems,” in: *Modelling and Study of Systems, Sci. Conf., May 22–25, 2007. Abstracts of Reports* [in Russian], Kiev (2007), p. 249.
413. M. V. Shamolin, ”On integrability in transcendental functions,” the abstract of a talk at the Workshop ”Actual Problems of Geometry and Mechanics.” in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 34.
414. M. V. Shamolin, ”On integrability of motion of four-dimensional body-pendulum situated in over-running medium flow,” the abstract of a talk at the Workshop ”Actual Problems of Geometry and Mechanics,” in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 37.
415. M. V. Shamolin, ”On rigid body motion in a resisting medium taking account of rotational derivatives of aerodynamic force moment in angular velocity,” the abstract of a talk at the Workshop
416. ”Actual Problems of Geometry and Mechanics,” in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 44.
417. M. V. Shamolin, ”On stability of a certain regime of rigid body motion in a resisting medium,” in: *Abstracts of Reports of Sci. Conf. ”Lomonosov Readings-2007,” Sec. Mechanics, Moscow, Moscow State Univ., April, 2007* [in Russian], MGU, Moscow (2007), p. 153.
418. M. V. Shamolin, ”On the problem of a symmetric body motion in a resisting medium,” in: *Book of Abstracts of EMAC-2007 (1–4 July, 2007, Hobart, Australia)*, Univ. Tasmania, Hobart, Australia (2007), p. 25.
419. M. V. Shamolin, ”On work of All-Russian Conference ‘Differential Equations and Their Applications,’ Samara, June 27-July 2, 2005,” the abstract of a talk at the Workshop ”Actual Problems of Geometry and Mechanics,” in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 45.
420. M. V. Shamolin, *Some Problems of Differential and Topological Diagnosis* [in Russian], Ekzamen, Moscow (2007).
421. M. V. Shamolin, ”The cases of complete integrability in dynamics of a rigid body interacting with a medium,” in: *Book of Abstracts of Int. Conf. on the Occasion of the 150th Birthday of A. M. Lyapunov (June 24–30, 2007, Kharkiv, Ukraine)*, Verkin Inst. Low Temper. Physics Engineer. NASU, Kharkiv (2007), pp. 147–148.
422. M. V. Shamolin, ”The cases of integrability in 2D-, 3D-, and 4D-rigid body,” in: *Abstracts of Short Communications and Posters of Int. Conf. ”Dynamical Methods and Mathematical Modelling,” Valladolid, Spain (September 18–22, 2007)*, ETSII, Valladolid (2007), p. 31.
423. M. V. Shamolin, ”The cases of integrability in terms of transcendental functions in dynamics of a rigid body interacting with a medium,” in: *Abstracts of 9th Conf. on Dynamical Systems (Theory and Applications) (DSTA 2007), Lodz, Poland, December 17–20, 2007*, Tech. Univ.

Lodz (2007), p. 115.
424. M. V. Shamolin, "The cases of integrability in terms of transcendental functions in dynamics of a rigid body interacting with a medium," in: *Proc. of 9th Conf. on Dynamical Systems (Theory and Applications) (DSTA 2007), Lodz, Poland, December 17–20, 2007*, Vol. 1, Tech. Univ. Lodz (2007), pp. 415–422.
425. M. V. Shamolin, "Variety of types of phase portraits in dynamics of a rigid body interacting with a medium," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 17.
426. M. V. Shamolin, "Three-parameter family of phase portraits in dynamics of a rigid body interacting with a medium," *Dokl. Ross. Akad. Nauk*, **418**, No. 1, 46–51 (2008). MR2459491
427. M. V. Shamolin and D. V. Shebarshov, "Projections of Lagrangian tori of a biharmonic oscillator on position state and dynamics of a rigid body interacting with a medium," in: *Modelling and Study of Stability of Systems, Sci. Conf., May 19–23, 1997. Abstracts of Reports* [in Russian], Kiev (1997), p. 142.
428. M. V. Shamolin and D. V. Shebarshov, "Lagrange tori and the Hamilton-Jacobi equation," in: *Book of Abstracts of Conf. "Partial Differential Equations: Theory and Numerical Solutions" (Praha, August 10–16, 1998)*, Charles Univ., Praha (1998), p. 88.
429. M. V. Shamolin and D. V. Shebarshov, "Certain problems of differential diagnosis," in: *Dynamical Systems Modelling and Stability Investigation. Sci. Conf., May 25–29, 1999. Abstracts of Reports (System Modelling)* [in Russian], Kiev (1999), p. 61.
430. M. V. Shamolin and D. V. Shebarshov, "Methods for solving main problem of differential diagnosis," Deposit, at VINITI, No. 1500-V99 (1999).
431. M. V. Shamolin and D. V. Shebarshov, "Some problems of geometry in classical mechanics," Deposit, at VINITI, No. 1499-V99 (1999).
432. M. V. Shamolin and D. V. Shebarshov, "Certain problems of differential diagnosis," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," *Fund. Prikl. Mat.*, **7**, No. 1, 305 (2001).
433. M. V. Shamolin and D. V. Shebarshov, "Certain problems of differential diagnosis," the abstract of a talk at the Workshop "Actual Problems of Geometry and Mechanics," in: *Contemporary Problems in Mathematics, Fundamental Directions* [in Russian], Vol. 23, All-Union Institute for Scientific and Technical Information, USSR Academy of Sciences, Moscow (2007), p. 19.
434. M. V. Shamolin and S. V. Tsyptsyn, "Analytical and numerical study of trajectories of body motion in a resisting medium," in: *Scientific Report of Institute of Mechanics, Moscow State Univ.* [in Russian], No. 4289, Institute of Mechanics, Moscow State Univ., Moscow (1993).
435. O. P. Shorygin and N. A. Shulman, "Entry of a disk into water at an angle of attack," *Uchen. Zap. TsAGI*, **8**, No. 1, 12–21 (1977).
436. S. Smale, "Rough systems are not dense," in: *A Collection of Translations, Mathematics* [in Russian], **11**, No. 4, 107–112 (1967).
437. S. Smale, "Differentiable dynamical systems," *Usp. Mat. Nauk*, **25**, No. 1, 113–185 (1970). MR0263116 (41 #7721)

438. V. M. Starzhinskii, *Applied Methods of Nonlinear Oscillations* [in Russian], Nauka, Moscow (1977). MR0495355 (58 #14067)
439. V. A. Steklov, *On Rigid Body Motion in a Fluid* [in Russian], Khar'kov (1893).
440. V. V. Stepanov, *A Course of Differential Equations* [in Russian], Fizmatgiz, Moscow (1959).
441. V. V. Strekalov, "Reflection in entrance of a disk into a water whose plane is close to the vertical plane," *Uchen. Zap. TsAGI*, **8**, No. 5, 66–73 (1977).
442. G. K. Suslov, *Theoretical Mechanics* [in Russian], Gostekhizdat, Moscow (1946).
443. E. I. Suvorova and M. V. Shamolin, "Poincaré topographical systems and comparison systems of higher orders," in: *Math. Conf. "Modern Methods of Function Theory and Related Problems," Voronezh, January 26-February 2, 2003* [in Russian], Voronezh State Univ., Voronezh (2003), pp. 251–252.
444. V. V. Sychev, A. I. Ruban, and G. L. Korolev, *Asymptotic Theory of Separation Flows* [in Russian], Nauka, Moscow (1987).
445. V. G. Tabachnikov, "Stationary characteristics of wings in small velocities under whole range of angles of attack," in: *Proc. of Central Aero-Hydrodynamical Inst.* [in Russian], Issue 1621, Moscow (1974), pp. 18–24.
446. Ya. V. Tatarinov, *Lectures on Classical Dynamics* [in Russian], Izd. Mosk. Univ., Moscow (1984). MR0778381 (85m:70001)
447. V. V. Trofimov, "Embeddings of finite groups in compact Lie groups by regular elements," *Dokl. Akad. Nauk SSSR*, **226**, No. 4, 785–786 (1976). MR0439984 (55 #12865)
448. V. V. Trofimov, "Euler equations on finite-dimensional solvable Lie groups," *Izv. Akad. Nauk SSSR, Ser. Mat.*, **44**, No. 5, 1191–1199 (1980). MR0595263 (82e:70006)
449. V. V. Trofimov, "Symplectic structures on automorphism groups of symmetric spaces," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 6, 31–33 (1984). MR0775300 (86b:53038)
450. V. V. Trofimov, "Geometric invariants of completely integrable systems," in: *Abstract of Reports of All-Union Conf. in Geometry "in the Large,"* Novosibirsk (1987), p. 121.
451. V. V. Trofimov and A. T. Fomenko, "A methodology for constructing Hamiltonian flows on symmetric spaces and integrability of certain hydrodynamic systems," *Dokl. Akad. Nauk SSSR*, **254**, No. 6, 1349–1353 (1980). MR0592507 (82b:58038)
452. V. V. Trofimov and M. V. Shamolin, "Dissipative systems with nontrivial generalized Arnol'd-Maslov classes," the abstract of a talk at the Workshop in Vector and Tensor Analysis Named after P. K. Rashevskii, *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 2, 62 (2000).
453. Ch. J. de la Vallée Poussin, *Lectures on Theoretical Mechanics*, Vols. I, II [Russian translation], Inostr. Lit., Moscow (1948, 1949).
454. L. E. Veselova, "On dynamics of a body with ellipsoidal hole filled with a fluid," *Vestn. Mosk. Univ. Ser. 1 Mat. Mekh.*, No. 3, 64–67 (1985). MR0789774 (86k:76009)
455. S. V. Vishik and S. F. Dolzhanskii, "Analogs of Euler-Poisson equations and magnetic electrodynamics related to Lie groups," *Dokl. Akad. Nauk SSSR*, **238**, No. 5, 1032–1035.
456. I. N. Vrublevskaya, "On geometric equivalence of trajectories and semitrajectories of dynamical systems," *Mat. Sb.*, **42** (1947).
457. I. N. Vrublevskaya, "Some criteria of equivalence of trajectories and semitrajectories of dynamical systems," *Dokl. Akad. Nauk SSSR*, **97**, No. 2 (1954). MR0067480 (16,734i)

458. C. L. Weyher, ”Observations sur le vol plane par obres,” *L’Aeronaute* (1890).
459. E. T. Whittecker, *Analytical Dynamics* [Russian translation], ONTI, Moscow (1937).
460. M. V. Yakobson, ”On self-mappings of a circle,” *Mat. Sb.*, **85**, 183–188 (1975).
461. N. E. Zhukovskii, ”On a fall of light oblong bodies rotating around their longitudinal axis,” in: *A Complete Collection of Works* [in Russian], Vol. 5, Fizmatgiz, Moscow (1937), pp. 72–80, 100–115.
462. N. E. Zhukovskii, ”On bird soaring,” in: *A Complete Collection of Works* [in Russian], Vol. 5, Fizmatgiz, Moscow (1937), pp. 49–59.
463. Yu. F. Zhuravlev, ”Submergence of a disk in a fluid at an angle to a free surface,” in: *A Collection of Works in Hydrodynamics* [in Russian], Central Aero Hydrodynamical Institute, Moscow (1959), pp. 164–167.
464. V. F. Zhuravlev and D. M. Klimov, *Applied Methods in Oscillation Theory* [in Russian], Nauka, Moscow (1988). MR0987633 (90g:70001)
465. N. A. Zlatin, A. P. Krasil’shchikov, G. I. Mishin, and N. N. Popov, *Ballistic Devices and Their Applications in Experimental Studies* [in Russian], Nauka, Moscow (1974).

Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

MR2459491 70E99 (37C99 37N05)

Shamolin, M. V. (RS-MOSC-IMC)

A three-parameter family of phase portraits in the dynamics of a rigid body interacting with the medium. (Russian)

Dokl. Akad. Nauk **418** (2008), *no. 1,* 46–51.

{There will be no review of this item.}

MR2432841 (2009f:70021) 70E99 (70E40 70K99)

Shamolin, M. V.

New integrable cases in the dynamics of a body interacting with a medium taking into account the dependence of the resistance force moment on the angular velocity. (Russian. Russian summary)

Prikl. Mat. Mekh. **72** (2008), *no. 2,* 273–287; *translation in* *J. Appl. Math. Mech.* **72** (2008), *no. 2,* 169–179.

Summary (translated from the Russian): "We construct two- and three-dimensional nonlinear models of the action of a medium on a rigid body, which take into account the dependence of the arm of the force on the reduced angular velocity of the body when the moment of force is also a function of the angle of attack. We find new cases of complete integrability in elementary functions, which makes it possible to discover qualitative analogies between the motions of free bodies in a resisting medium and the oscillations of bodies that are partially fixed and immersed in a flow of the medium. We show that if the additional damping action of the medium on the body that occurs in the system is significant, then it is possible to stabilize the rectilinear translational deceleration of the body when it moves with finite angles of attack. In this connection, the question of the roughness of the description of this phenomenon is of current interest: a finer property of relative roughness is discovered in the investigation of reduced dynamical systems."

MR2894678 70E15 (70K20)

Shamolin, M. V. (RS-MOSC-MC)

Some model problems of dynamics for a rigid body interacting with a medium. (English summary)

Internat. Appl. Mech. **43** (2007), *no. 10,* 1107–1122.1573-8582

{There will be no review of this item.}

MR2449984 74A50 (76A99)
Aĭdagulov, R. R. (RS-MOSC-IMC); **Shamolin, M. V.** (RS-MOSC-IMC)
A phenomenological approach to the determination of interphase forces. (Russian)
Dokl. Akad. Nauk **412** (2007), *no. 1,* 44–47.

{There will be no review of this item.}