

Sergei Avdonin

LIST OF PUBLICATIONS

Books

1. S.A. Avdonin and S.A. Ivanov, *Families of Exponentials. The Method of Moments in Controllability Problems for Distributed Parameter Systems*, Cambridge University Press, 1995, New York, London, Melbourne.
2. S.A. Avdonin and S.A. Ivanov, *Controllability of Distributed Parameter Systems and Families of Exponentials*, Kiev, UMKVO, 1989 (Russian).

Articles

3. S. Avdonin and P. Kurasov, *Inverse problems for quantum trees*, Inverse Problems and Imaging, **2** (2008), no. 1, 1–21.
4. S. Avdonin, V. Mikhaylov and A. Rybkin, *The boundary control approach to the Titchmarsh-Weyl m -function*, Comm. Math. Phys., **275** (2007), no. 3, 791–803.
5. S. Avdonin, A. Bulanova and W. Moran, *Construction of sampling and interpolating sequences for multi-band signals. The two-band case*, Int. J. Appl. Math. Comput. Sci., **17** (2007), no. 2, 101–113.
6. S. Avdonin and S. Ivanov, *Vector sampling and interpolation problems*, IEEE Trans. Signal Proc., (2008), to appear.
7. S. Avdonin, A. Bulanova and D. Ovsyannikov, *Optimal cubature formulae related to solutions of initial boundary value problems*, Vestnik St. Petersburg Univ., (2008), no. 2, to appear.
8. S.A. Avdonin and B.P. Belinskyi, *On controllability of a rotating string*, Journal of Mathematical Analysis and Applications, **321** (2006), no. 1, 198–212.
9. S.A. Avdonin, L.A. Dmitrieva, Yu.A. Kuperin and V.V. Sartan, *Solvable model of spin-dependent transport through the finite array of quantum dots*, J. Phys. A, **38** (2005), 4825–4833.
10. S.A. Avdonin and B.P. Belinskyi, *On the basis properties of the functions arising in the boundary control problem of a string with a variable tension*, Discrete and Continuous Dynamical Systems: A Supplement Volume, (2005), 40–49.
11. S.A. Avdonin, L.A. Dmitrieva, Yu.A. Kuperin and V.V. Sartan, *Spin-dependent transport through the finite array of quantum dots: Spin-Gun*, "In: Quantum Dots: Research Developments", Nova Science Publishers, (2005) Editor: Peter A. Ling, pp. 89–121.
12. S. Avdonin, S. Lenhart and V. Protopopescu, *Determining the potential in the Schrödinger equation from the Dirichlet to Neumann map by the Boundary Control method*, J. Inverse and Ill-Posed Problems, **13** (2005), no. 5, 317–330 .

13. S.A. Avdonin and M.I. Belishev, *Dynamical inverse problem for the multidimensional Schrödinger equation*, Proc. St. Petersburg Math. Soc., **10** (2004), 3–18, Russian, Engl. Transl. in Amer. Math. Soc. Transl. Ser. 2, **214**, 1–14, Amer. Math. Soc., Providence, RI, 2005.
14. S.A. Avdonin and B.P. Belinskyi, *Exact control of a string under an axial stretchnig tension*, Discrete and Continuous Dynamical Systems, Expanded Volume (2003), 57–67.
15. S. Avdonin and S. Lenhart, and V. Protopopescu, *Solving the dynamical inverse problem for the Schrödinger equation by the Boundary Control method*, Inverse Problems, **18** (2002), 41–57.
16. S.A. Avdonin and T.I. Seidman, *Pointwise and internal controllability for the wave equation*, Applied Mathematics and Optimization, **46** (2002), 107–124.
17. S.A. Avdonin and W. Moran, *Simultaneous control problems for systems of elastic strings and beams*, Systems and Control Letters, **44** (2001), no. 2, 147–155.
18. S. Avdonin and W. Moran, *Ingham type inequalities and Riesz bases of divided differences*, Int. J. Appl. Math. Comput. Sci., **11** (2001), no. 4, 101–118.
19. S. Avdonin and M. Tucsnak, *On the simultaneously reachable set of two strings*, ESAIM: Control, Optimization and Calculus of Variations, **6** (2001), 259–273.
20. S.A. Avdonin and S.A. Ivanov, *Exponential Riesz bases of subspaces and divided differences*, St. Petersburg Mathematical Journal, **13** (2001), no. 3, 339–351.
21. S.A. Avdonin, S.A. Ivanov, and D.L. Russell, *Exponential bases in Sobolev spaces in control and observation problems for the wave equation*, Proc. Royal Soc. Edinburgh, **130A** (2000), no. 5, 947–970.
22. T.I. Seidman, S.A. Avdonin, and S.A. Ivanov, *‘Window’ problem for complex exponentials*, J. Fourier Analysis Appl., **6** (2000), no. 3, 233–254.
23. S.A. Avdonin and S.A. Ivanov, *Levin–Golovin theorem for the Sobolev spaces*, Math. Notes, **68** (2000), no. 1-2, 145–153.
24. S.A. Avdonin, N.G. Medhin, and T.L. Sheronova, *Identification of a piecewise constant coefficient in the beam equation*, J. Comp. Appl. Math., **114** (2000), 11–21.
25. S.A. Avdonin, M.I. Belishev, and Yu.S. Rozhkov, *A dynamic inverse problem for the non-selfadjoint Sturm–Liouville operator*, J. Math. Sci., **102** (2000), no. 4, 4139–4148.
26. S.A. Avdonin and S.A. Ivanov, *Controllability types for a circular membrane with rotationally symmetric data*, Control and Cybernetics, **28** (1999), no. 3, 383–396.
27. S. Avdonin and W. Moran, *Sampling and interpolation of functions with multi-band spectra and controllability problems*, in “Optimal Control of Partial Differential Equations”, Hoffmann, K.-H., Leugering, G., Tröltzsch F. (Eds.), Birkhäuser, **133** (1999), 43–51.
28. S.A. Avdonin, S.A. Ivanov, and D.L. Russell, *Exponential bases in Sobolev spaces in control and observation problems*, in “Optimal Control of Partial Differential Equations”, Hoffmann, K.-H., Leugering, G., Tröltzsch F. (Eds.), Birkhäuser, **133** (1999), 33–42.

29. S.A. Avdonin, M.I. Belishev, and Yu.S. Rozhkov, *The BC-method in the inverse problem for the heat equation*, J. Inverse and Ill-Posed Problems, **5** (1997), 309–322.
30. S.A. Avdonin, M.I. Belishev, and S.A. Ivanov, *Controllability in filled domain for the wave equation with singular boundary control*, J. Math. Sci., **83** (1997), no. 2, 165–174.
31. S.A. Avdonin and M.I. Belishev, *Boundary control and dynamical inverse problem for non-selfadjoint Sturm–Liouville operator*, Control and Cybernetics, **25** (1996), 429–440.
32. S.A. Avdonin and T.I. Seidman, *Identification of $q(x)$ in $u_t = \Delta u - qu$ from boundary observations*, SIAM J. Control Optimization, **33** (1995), 1247–1255.
33. S.A. Avdonin and S.A. Ivanov, *Boundary controllability problems for the wave equation in a parallelepiped*. Appl. Math. Letters, **8** (1995), 97–102.
34. S.A. Avdonin and O.P. Germanovich, *The basis property of a family of Floquet solutions of a linear periodic equation of neutral type in a Hilbert space*, Siberian Math. J., **36** (1995), 853–858 .
35. S.A. Avdonin, S.A. Ivanov, and I. Joó, *Exponential series in the problem of initial and pointwise control of a rectangular vibrating membrane*, Studia Sci. Math. Hung., **30** (1995), 243–259.
36. S.A. Avdonin and O.Ya. Gorshkova, *Controllability and quasicontrollability of parabolic systems with delay*, Differential Equations, **28** (1992), 374–383.
37. S.A. Avdonin, M.I. Belishev, and S. A. Ivanov, *Matrix inverse problem for the equation $u_{tt} - u_{xx} + Q(x)u = 0$* , Math. USSR Sbornik, **7** (1992), 287–310.
38. S.A. Avdonin, *The existence of basis subfamilies of a Riesz basis from exponentials*, Vestnik Leningrad Univ. Math., **24** (1991), no. 3, 59–60.
39. S.A. Avdonin, S.A. Ivanov, and A.Z. Ishmukhametov, *Quadratic cost optimal control of a string vibrations*, Soviet Math. Dokl., **43** (1991), 154–158.
40. S.A. Avdonin, M.I. Belishev, and S.A. Ivanov, *Dirichlet boundary control in filled domain for the multidimensional wave equation*, Soviet J. Automat. Inform. Sci., **24** (1991), 76–80.
41. S.A. Avdonin, S.A. Ivanov, and I. Joó, *Initial and pointwise control of the vibrations of a rectangular membrane*, Soviet J. Automat. Inform. Sci., **6** (1990), 68–71.
42. S.A. Avdonin, S.A. Ivanov, and I. Joó, *Families of exponentials and controllability of a rectangular membrane*, Studia Sci. Math. Hung., **25** (1990), 291–306.
43. S.A. Avdonin and S.A. Ivanov, *Generating matrix-function in problem of controlling vibrations of connected strings*, Soviet Math.Dokl., **40** (1990), 179–183.
44. S.A. Avdonin and V.V. Chudinov, *Design of a control of the oscillations of a nonhomogeneous string*, Partial Differential Equations, 23–30, Leningrad Ped. Inst., Leningrad, 1990 (Russian), MR 1109075.
45. S.A. Avdonin, M. Horvath, and I. Joó, *Riesz bases from elements of the form $x^k e^{i\lambda_n x}$* , Vestnik Leningrad Univ. Math., **22**, no. 4 (1989), 1–6.

46. S.A. Avdonin, S.A. Ivanov, and I. Joó, *On theorem of N. K. Bari*, *Studia Sci. Math. Hung.*, **24** (1989), 259–261.
47. S.A. Avdonin, S.A. Ivanov, and I. Joó, *On Riesz bases from vector exponentials. I*, *Annales Univ. Sci. Budapest*, **32** (1989), 101–114.
48. S.A. Avdonin, S.A. Ivanov, and I. Joó, *On Riesz bases from vector exponentials. II*, *Annales Univ. Sci. Budapest*, **32** (1989), 115–126.
49. S.A. Avdonin, *Exact and approximate controllability of evolution systems*, *Problems Mech. Control Proc.* **12** (1989), 5–14, Leningrad Univ., Leningrad (Russian), MR 1064527 (92a:93017).
50. S.A. Avdonin and V.V. Chudinov, *Design of controls of a system of hyperbolic type*, *Partial Differential Equations*, 115–121, Leningrad Ped. Inst., Leningrad, 1989 (Russian), MR 1032319.
51. S.A. Avdonin and V.V. Chudinov, *Observability and exact controllability of the wave equation with Neumann boundary control*, Leningrad Ped. Inst., 1989, 9 p. VINITI 08.01.90, no. 125 (Russian).
52. S.A. Avdonin and T.K. Karaeva, *On controllability of hyperbolic systems with time delays*, Leningrad State University, 1989, 7 p., VINITI 20.09.89, no. 5952 (Russian).
53. S.A. Avdonin and I. Joó, *Riesz bases of exponentials and sine type functions*, *Acta Math. Hung.* **51** (1988), 3–14.
54. S.A. Avdonin and D.A. Ovsyannikov, *An approach to the construction of optimal cubature formulas*, *Partial Differential Equations*, 153–158, Leningrad Ped. Inst., Leningrad, 1988 (Russian), MR 0998987 (90h:65028).
55. S.A. Avdonin and O.Ya. Gorshkova, *On the controllability of parabolic systems with delay in the highest derivative*, *Partial Differential Equations*, 113–118, Leningrad Gos. Inst., Leningrad, 1987 (Russian), MR 0959163 (89i:93007).
56. S.A. Avdonin and O.Ya. Gorshkova, *Controllability of multidimensional parabolic systems with delay*, *Mathematical Physics*, 95–99, Leningrad Gos. Ped. Inst., Leningrad, 1987 (Russian), MR 0939392 (89e:93014).
57. S.A. Avdonin and O.Ya. Gorshkova, *Controllability of parabolic systems with time delays*, Leningrad Ped. Inst., 1987. 21 p. VINITI 22.01.87, no. 506 (Russian).
58. S.A. Avdonin and O.Ya. Gorshkova, *On controllability of parabolic systems with time delay in control*, Leningrad Ped. Inst., 1987. 12 p. VINITI 20.05.87, no. 3538 (Russian).
59. S.A. Avdonin and O.Ya. Gorshkova, *Controllability of multidimensional parabolic systems with time delay*, Leningrad Ped. Inst., 1987. 26 p. VINITI 14.08.87, no. 5989 (Russian).
60. S.A. Avdonin and K.B. Nurtazina, *Optimality conditions in control problems of hyperbolic systems with time delays*, Leningrad Ped. Inst., 1987. 12 p. VINITI 25.05.87, no. 3539 (Russian).
61. S.A. Avdonin and K.B. Nurtazina, *Design of controls of a system of hyperbolic type with time delays in boundary conditions*, Leningrad Ped. Inst., 1987. 15 p. VINITI 28.09.87, no. 6967 (Russian).

62. S.A. Avdonin and O.Ya. Gorshkova, *On the controllability and quasicontrollability of systems of parabolic type with delay*, Partial Differential Equations, 53–55, Leningrad Gos. Inst., Leningrad, 1986 (Russian), MR 0895850 (88e:93009).
63. S.A. Avdonin and K.B. Nurtazina, *Solving the stabilization problem for a hyperbolic type system*, Differential Equations and Applied Problems, 123–125, Tula Univ., Tula, 1986 (Russian).
64. S.A. Avdonin and S.A. Ivanov, *Serial bases of exponentials and the problem of complete damping of a system of strings*, Soviet Phys. Dokl., **29** (1984), 182–184.
65. S.A. Avdonin and K.B. Nurtazina, *On the boundary control for a hyperbolic type equation*, Mathematical Physics, 68–74, Leningrad Ped. Inst., Leningrad, 1984 (Russian).
66. S.A. Avdonin and S.A. Ivanov, *Riesz bases of exponentials in a space of vector-valued functions and controllability of a nonhomogeneous string*, Operator Theory and Function Theory, 62–68, Leningrad Univ., 1983 (Russian), MR 0768778 (86b:46058).
67. S.A. Avdonin and T.K. Karaeva, *Control of the oscillations of a nonhomogeneous string*, Optimal Control of Mech. Systems, 87–92, Leningrad Univ., 1983 (Russian).
68. S.A. Avdonin, *Controllability of connected string systems*, Math. Methods in Control Mech. Systems, 3–9, Leningrad Univ., 1982 (Russian).
69. S.A. Avdonin, N.B. Avdonina, and S.V. Petrov, *Diffusion model of drying in drum-type apparatus*, Journal of Appl. Chem., **55**, no. 5, (1982), 1073–77 (Russian), ISSN: 0044-4618.
70. S.A. Avdonin, *On controllability of a singular string*, Problems of Control Mechanics, Perm', 1982, 3–8 (Russian).
71. S.A. Avdonin, *On controllability of distributed parameter systems*, Vestnik Leningrad Univ., **19**, no. 4 (1980), 5–8 (Russian), MR 0609136 (82c:93003).
72. S.A. Avdonin, *On Riesz bases of exponentials in L^2* , Vestnik Leningrad Univ. Math., **7** (1979), 203–211.
73. S.A. Avdonin, *Solution of the exponential moment problems in space $L^2(0, \infty)$* , Zap. Nauch. Semin. Leningr. Otd. Mat. Inst. Steklov (LOMI), **74** (1977), 193–194 (Russian), MR 0513176 (80a:30037).
74. S.A. Avdonin, *On the question of Riesz bases consisting of exponential functions in L^2* , J. Soviet Math., **8** (1977), 130–131.
75. S.A. Avdonin and I.O. Protod'yakonov, *Study of the control of a desorber with a fluidized bed of a sorbent*, Journal of Appl. Chem., **49**(1), (1976), 241, ISSN: 0044-4618, 12 p. VINITI 11.08.75, no. 2433 (Russian).
76. S.A. Avdonin, *Concerning one method of studying the control of technological systems described by differential equations of hyperbolic type*, Journal of Appl. Chem., **49**(1), (1976), 241, ISSN: 0044-4618, 14 p. VINITI 11.08.75, no. 2430 (Russian).
77. S.A. Avdonin, V.D. Nogin and I.O. Protod'yakonov, *On a functional–dynamical model of complex systems*, Theor. Found. Chem. Technol., **8**, no. 3, (1974), 386–395. (Russian).

78. S.A. Avdonin, B.V. Efremov, and V.A. Fedorov, *Removal of metal ions from waste waters*, Theor. Found. Chem. Technol., **8**, no. 4, (1974), 613–616 (Russian), ISSN: 0040-3571.
79. S.A. Avdonin, V.D. Nogin, and R.I. Trukhaev, *Semi-markov processes in modelling of complex systems*, Seminars on Cybernetics, Kishinev Polytech. Inst., 1974, no. 41, 16 p. (Russian).
80. S.A. Avdonin and R.I. Trukhaev, *On efficiency estimates of complex systems*, Seminars on Cybernetics, Kishinev Polytech. Inst., 1973, no. 34, 28 p. (Russian).

Proceedings of Conferences

81. S. Avdonin, K. Nurtazina and T. Sheronova, *Boundary Controllability and Inverse Problem for the Wave Equation on Graphs*, Proc. CD of the 14th Mediterranean Conference on Control Automation, Ancona, Italy, June 28-30, 2006.
82. S. Avdonin and S. Ivanov, *Non-separated sampling sets of band-limited signals*, Proc. CD of the 6-th Intern. SAMPTA Conf., Samsun, Turkey, July 10-15, 2005.
83. S. Avdonin, S. Lenhart and V. Protopopescu, *Recovering the potential in the Schrödinger equation from the $N-D$ map*, 11-th Conference on Waves and Stability in Continuous Media (Porto Ercole), 14–27, World Sci. Publishing, River Edge, NJ, 2002.
84. S. Avdonin, *Simultaneous controllability of several elastic strings*, Proceedings CD of the Fourteenth International Symposium on Mathematical Theory of Networks and Systems, Perpignan, France, June 19–23, 2000.
85. S.A. Avdonin and V.V. Chudinov, *Existence and uniqueness of the solution to the nonhomogeneous hyperbolic equation*, Proc. IV Siberian Congress on Applied and Industrial Mathematics, Novosibirsk, Inst. Math., 2000, v. 1, 3–4 (Russian).
86. S. Avdonin and W. Moran, *Control of elastic networks and bases of exponential divided differences*, Proc. Intern. Conf. “Math. Methods Optim. Control”, 6 p. Ekaterinburg, June 1-4, 2000.
87. Bill Moran and Sergei Avdonin, *Sampling of multi-band signals*, ICIAM 99 (Edinburgh), Oxford Univ. Press, 163–174, 2000.
88. S.A. Avdonin and D.A. Ovsyannikov, *Optimal control of distributed parameter systems in the theory of cubature formulae*, Proceedings of the International Conference on Optimization Techniques and Applications, Perth, July 1–3, 1998, v.1, 360–365.
89. S.A. Avdonin and S. A. Ivanov, *Controllability of networks of elastically connected strings*, Proceedings of the 31th IEEE Conference on Decision and Control, December 16-18, 1992, Tuscon, Arizona, pp. 3009-3011.
90. S.A. Avdonin and S.A. Ivanov, *Controllability of distributed parameter systems with finite dimensional boundary control*. Proceedings of the Soviet-Polish Workshop “Mathematical Methods of Optimal Control and its Applications”, Minsk, May 16-19, 1989, pp. 5-6.
91. S.A. Avdonin and O.P. Germanovich, *The basis property of a family of Floquet solutions of a linear periodic equation of neutral type*, Proc. USSR Conf. on Differential and Functional Equations, Riga, April 1989, pp. 12–13 (Russian).

92. S. Avdonin, M. Belishev and S. Ivanov, *Boundary control for hyperbolic systems and inverse problems*. Proceedings of the Conference “Differential Equations and its Applications”, Frunze, Sept. 14-15, 1989, pp. 94-95 (Russian).
93. S.A. Avdonin, *Properties of vector-valued exponentials in initial boundary value problems of the control theory*. Proceedings of the Conference “Classical and Nonclassical Boundary Value Problems for PDE, Special Functions, Integral Equations and its Appl.” Kuibyshev, 1987, April 25-29, 1987, pp. 45-46 (Russian).
94. S.A. Avdonin and O.Ya. Gorshkova, *On controllability and quasi-controllability of multidimensional parabolic systems with time delay*, Proc. USSR Conf. on Functional and Differential Equations, Dushanbe, Sept. 28-30, 1987, 12-13 (Russian).
95. S.A. Avdonin and T.K. Karaeva, *Vector bases of exponentials and control problems for the hyperbolic type systems*, Proc. of the Conf. of Young Mathematicians, Budapest, May 23-27, 1984, pp. 104-107.
96. S.A. Avdonin, *Completeness, minimality, and basis property of exponential system in spaces of vector-function and control problems*, Proceedings of “Workshop on the Operator Theory in Functional Spaces”, Minsk, 1982, pp. 3-4 (Russian).

Preprints

97. S. Avdonin and P. Kurasov, *Inverse Problems for Quantum Trees*, The Isaac Newton Institute, Preprint NI07022, 3rd April 2007.
98. S. Avdonin, V. Mikhaylov, and A. Rybkin, *The boundary control approach to the Titchmarsh-Weyl m -function. I. The response operator and the A -amplitude*, Preprint, 13 p., 2006, www.ma.utexas.edu/mp-arc/c/06/06-342.pdf.
99. S.A. Avdonin, L.A. Dmitrieva, Yu.A.Kuperin and V.V.Sartan, *Spin-Dependent Transport through the Finite Array of Quantum Dots: Spin Gun*, Los Alamos National Laboratory, Preprint Archive, Condensed Matter (2003), arXiv: cond-mat/0310632 v1.
100. S. Avdonin, N. Bagraev, A. Mikhailova, and B. Pavlov, *Resonance Quantum Gate*, Los Alamos National Laboratory, Preprint Archive, Condensed Matter (2002), 1-14, arXiv:hep-ex/0207182.
101. S.A. Avdonin, L.A. Dmitrieva, Yu.A. Kuperin, G.E. Rudin, *Correlated Tunnelling of Two Electrons through a Barrier in Quantum Wires*, Los Alamos National Laboratory, Preprint Archive, Math. Physics (2002), 15 p., arXiv:math-ph/0311033 v1.

Submitted Papers

102. S. Avdonin and S. Ivanov, *Sampling problem for nonseparated sets and divided differences.*
103. S. Avdonin and V. Mikhaylov, *The boundary control approach to spectral inverse problems.*
104. S. Avdonin, A. Bulanova and D. Nicolsky, *Boundary control approach to the spectral estimation problem. The case of simple poles.*
105. S. Avdonin and A. Bulanova, *Boundary control approach to the spectral estimation problem. The case of multiple poles.*
106. S. Avdonin, V. Kozlov, D. Maxwell, and M. Truffer, *Iterative methods for solving a nonlinear boundary inverse problem in glaciology.*
107. D. Maxwell, M. Truffer, S. Avdonin, and M. Stuefer, *Determining glacier velocities and stresses with inverse methods: an iterative scheme, accepted.*
108. S.A. Avdonin and S.A. Ivanov, *Controllability of the wave and beam equations with structural damping.*
109. S.A. Avdonin, B.P. Belinskyi and S.A. Ivanov, *Exact controllability of an elastic ring, accepted.*
110. S. Avdonin and V. Mikhailov, *Controllability of partial differential equations on graphs, accepted.*
111. S. Avdonin, P. Kurasov and M. Nowaczyk, *On the reconstruction of boundary conditions for star graphs.*
112. S. Avdonin, *Control problems on quantum graphs, accepted.*