

## PUBLICATION LIST

### Teaching books

Physics abroad. 1988. Part B (Teaching): collections of papers. English translation.-M. "Mir", 1988 (in Russian).

V. V. Ganin, N. V. Ganina, M. V. Fistul. Physics World. Book 1. Mechanics-M.: Russian Open Universiy, 1992 (in Russian).

### Scientific papers

1. L.G. Aslamazov, M.V. Fistul. "Critical current of Josephson junctions with a semiconductor layer" JETP.Lett., **30**, 213 (1979).
2. L.G. Aslamazov, M.V. Fistul. "Temperature dependence of the critical current of superconductor-semiconductor-superconductor junctions" Sov.Phys.JETP, **54**, 206 (1981).
3. L.G. Aslamazov, M.V. Fistul. "Resonant tunneling at the superconductor-semiconductor-superconductor junctions" Sov.Phys.JETP, **56**, 666 (1982).
4. L.G. Aslamazov, M.V. Fistul. "Current-Voltage Characteristic of a superconductor-semiconductor-superconductor junction" Sov.Phys.JETP, **59**, 887 (1984).
5. G.V. Mairanovskii, V.I. Fistul, M.V. Fistul. "Concentration profiles in nonisothermal diffusion in solids" Sov.Phys.Semicond., **19**, 1284 (1985).
6. A.V. Tartakovskii, M.V. Fistul, M.E. Raich, I.M. Ruzin "Hopping conductivity of metal-semiconductor-metal contacts" Sov.Phys.Semicond., **21**, 500 (1987).
7. A.A. Varlamov, A.V. Pantsulaya, M.V. Fistul. "Anomalies in the properties of tunneling and Josephson junctions in the vicinity of a Lifshits topological transition" Sov.Phys.JETP, **66**, 396 (1987).
8. L.G. Aslamazov, M.V. Fistul. "Dependence of the critical current on the magnetic field applied to disordered Josephson junctions" Sov.Phys.JETP, **66**, 609 (1987).
9. A.V. Tartakovskii, M.V. Fistul "Quasiparticle current in superconductor-semiconductor-superconductor junctions" Sov.Phys.JETP, **67**, 1935 (1988).
10. M.V. Fistul. "Critical current of the Josephson junctions with randomly distributed vortices" JETP.Lett., **49**, 114 (1989).
11. M.V. Fistul. "Mesoscopic behavior of Josephson junctions with randomly disposed Abrikosov vortices" Sov.Phys.JETP, **69**, 190 (1989).
12. M.V. Fistul. "Critical current of the Josephson junctions with randomly distributed vortices" JETP.Lett., **52**, 193 (1990).
13. V.N. Gubankov, M.P. Lisitskii, I.L. Serpuchenko, M.V. Fistul. "Effect of Abrikosov vortices on the critical current of a Josephson junction" Sov.Phys.JETP, **73**, 711 (1991).
14. M.V. Fistul. "Current-Voltage characteristic of the HTS-metal junctions" Physica C, **185-189**, 2615 (1991).
15. V.V. Dorin, M.V. Fistul. "Mesoscopic fluctuations of the Josephson current through small junctions" Sov.Phys.JETP, **74**, 683 (1992).
16. V.N. Gubankov, M.P. Lisitskii, I.L. Serpuchenko, F.N. Sclokin, M.V. Fistul. "Influence of trapped Abrikosov vortices on the critical current of the Josephson tunnel junction" Supercond.Sci.Technol. **5**, 168 (1992).

17. A.P. Volodin, J. Aarts, I.V. Falkovsky, M.V. Fistul. "Sharp anomalies in the point-contact spectra of  $Bi_2Sr_2CaCu_2O_x$  investigated with an adjustable point contact" *Physica C*, **201**, 426 (1992).
18. V.V. Dorin, M.V. Fistul. "Critical current of a Josephson junction with spatial fluctuations of the order parameter" *Phys.Rev.*, **B46**, 13951, (1992).
19. V.N. Gubankov, M.P. Lisitskii, I.L. Serpuchenko, M.V. Fistul. "Pinning of fluxons by structure of Abrikosov vortices in long Josephson tunnel junction" *IEEE Trans.Appl.Supercond.*, **3**, 2516 (1993).
20. M.V. Fistul, G.F. Giuliani. "Critical current of a Josephson junction in layered superconductors" *Phys. Rev. B*, **47**, 11341 (1993).
21. V.N. Gubankov, M.P. Lisitskii, I.L. Serpuchenko, M.V. Fistul. "Fluxon pinning by an array of Abrikosov vortices in a long Josephson junction" *JETP Lett.*, **57**, 487 (1993).
22. V.N. Gubankov, M.P. Lisitskii, I.L. Serpuchenko, M.V. Fistul. "Interaction of Josephson vortices with a chain of trapped Abrikosov vortices in a long Josephson tunnel junction" *Physica B* **194-196**, 1697 (1994).
23. M.V. Fistul, G.F. Giuliani. "Critical current of a lateral Josephson junction for layered superconductors" *Phys. Rev. B*, **50**, 7026 (1994).
24. M.V. Fistul, G.F. Giuliani. "Magnetic field dependence of the critical current of a layered superconductor" *Physica C*, **230**, 9 (1994).
25. M.V. Fistul, G.F. Giuliani. "Theory of finite size effects and vortex penetration in small Josephson junctions" *Phys. Rev. B*, **51**, 1090 (1995).
26. Shi Li, M. Fistul, J. Deak, P. Metcalf and M. McElfresh. "Critical scaling of the transport behavior and the magnetic phase diagram of polycrystalline  $YBa_2Cu_3O_7$ ", *Phys. Rev. B*, 739 **52** (1995).
27. Shi Li, M. Fistul, J. Deak, P. Metcalf, G.F. Giuliani, M. McElfresh and D.L. Kaiser. "Magnetotransport behavior of polycrystalline  $YBa_2Cu_3O_7$ : A possible role for surface barriers", *Phys. Rev. B*, **52** 747 (1995).
28. M.P. Lisitskii, V.N. Gubankov, I.L. Lapitskaia and M.V. Fistul. "Influence of trapped Abrikosov vortices on the critical current of the Josephson tunnel junction", *Fourth Euro Ceramics*, **7** 277-288 (1995).
29. M.V. Fistul and G.F. Giuliani. "Generalized Eck peak in inhomogeneous Josephson junctions" , *Physica C*, **273** 309-313 (1997).
30. M.V. Fistul and G.F. Giuliani. "Current-voltage characteristic of a Josephson junction with randomly distributed Abrikosov vortices", *Phys. Rev. B*, **56** 788-794 (1997).
31. Samir Ranjan, Mikhail V. Fistul and Gabriele F. Giuliani. "Effects of intrinsic inelastic scattering on the critical current of a Josephson junction", *Europhys. Lett.*, **39(3)**, 317 (1997).
32. Mikhail V. Fistul and Gabriele F. Giuliani. "Effect of randomly distributed anisotropic vortices on the critical current of a layered superconductor", *Physica C*, **289** 291-298 (1997).
33. Mikhail V. Fistul and Gabriele F. Giuliani. "Critical current of a long Josephson junction in the presence of a perturbing Abrikosov vortex", *Phys. Rev. B*, **58**, 9343-9347

(1998).

34. M. V. Fistul and G. F. Giuliani. "Abrikosov vortices in long Josephson junctions", Phys. Rev. B, **58**, 9348-9353 (1998).

35. G. Yu. Logvenov, M. V. Fistul and Paul Müller. "c-Axis current-voltage characteristics and critical current statistics of intrinsic Josephson junctions in  $\text{Bi}_2\text{SrCa}_2\text{O}_{8+x}$  single crystals", Phys. Rev. B, **59**, 4524-4528 (1999).

36. E. Il'ichev, M. V. Fistul, V. Zakosarenko, R. P. J. IJsselsteijn, H. E. Hoenig, P. Müller, and H. -G. Meyer. "Phase dependence of the Josephson current in inhomogeneous high- $T_c$  grain boundary junctions", Phys. Rev. B, **59**, 11502-11505 (1999).

37. P. Caputo, M. V. Fistul, B. A. Malomed, S. Flach and A. V. Ustinov, "Cavity resonances in Josephson junction ladders", Phys. Rev. B, **59**, 14050-14053 (1999).

38. Y. I. Koval, N. Thyssen, A. Wallraff, M. V. Fistul and A. V. Ustinov. "Narrow long Josephson junctions", IEEE Appl. Supercond. **9**, 3957-3960 (1999).

39. M. V. Fistul, M. G. Castellano, M. Cirillo, G. Torrioli, A. Wallraff and A. V. Ustinov. "Escape of a Josephson vortex trapped in an annular Josephson junction", Physica B, **284-288**, 585 (2000).

40. M. V. Fistul, P. Caputo, and A. V. Ustinov. "Resonances in spatially-modulated long Josephson junctions", Phys. Rev. B, **60**, 13152 (1999).

41. D. Abraimov, P. Caputo, G. Filatrella, M. V. Fistul, G. Yu. Logvenov, and A. V. Ustinov. "Broken symmetry of row switching in 2D Josephson junction arrays", Phys. Rev. Lett. **83**, 5354 (1999).

42. A. Wallraff, Y. Koval, M. Levitchev, M. V. Fistul, and A. V. Ustinov. "Fluxon interaction with a magnetic field-induced potential in a long Josephson junction", J. Low Temp. Phys. **118**, 543 (2000)

43. M. V. Fistul and A. V. Ustinov, "Analysis of a hot-spot response of a long Josephson junction in the flux-flow regime", Inst. Phys. Conf. Ser, **167**, 177 (2000).

44. P. Binder, P. Caputo, M. V. Fistul, A. V. Ustinov, and G. Filatrella, "Experimental critical patterns in Josephson junction ladders", Phys. Rev. B, **62**, 8679 (2000).

45. M. V. Fistul and A. V. Ustinov, "Novel libration states of a nonlinear oscillator: resonant escape of a pinned magnetic fluxon", Phys. Rev. B., **63**, 024508 (2001).

46. E. Il'ichev, M. V. Fistul, B. A. Malomed, H. E. Hoenig, and H.-G. Meyer, "Observation of non-equilibrium libration states in a single-junction superconducting quantum interferometer", Europhys. Lett., **54**, 515 (2001).

47. D. Abraimov, A. G. Sivakov, A. V. Lukashenko, M. V. Fistul, P. Müller and A. V. Ustinov, "Spatially resolved measurements of critical parameters in superconducting filaments by laser scanning technique", IEEE Appl. Supercon. **11** 3170 (2001).

48. P. Caputo, M. V. Fistul, and A. V. Ustinov, "Resonances in one and two rows of triangular Josephson junction cells", Phys. Rev. B **63**, 214510 (2001).

49. M. V. Fistul and J. B. Page, "Penetration of dynamic localized states in DC driven Josephson junction ladders by discrete jumps", Phys. Rev. E **64**, 036609 (2001).

50. A. E. Miroshnichenko, S. Flach, M. V. Fistul, Y. Zolotaryuk, and J. B. Page, "Breathers in Josephson junction ladders: resonances and electromagnetic waves spec-

troscopy”, Phys. Rev. E **64**, 066601 (2001).

51. M. V. Fistul, E. Goldobin, and A. V. Ustinov, ”AC induced damping of a fluxon in long Josephson junction”, Phys. Rev. B, **64** 092501 (2001).

52. A. Benabdallah, M. V. Fistul, S. Flach, ”Breathers in a single plaquette of Josephson junctions: existence, stability and resonances”, Physica D, **159** 202-214 (2001).

53. M. V. Fistul, S. Flach, and A. Benabdallah, ”Magnetic field induced control of breather dynamics in a single plaquette of Josephson junctions”, Phys. Rev. E **65**, 046616 (2002)

54. M. V. Fistul, ”Symmetry broken motion of a periodically driven Brownian particle: nonadiabatic regime.”, Phys. Rev. E **65**, 046621 (2002).

55. S. Flach, Y. Zolotaryuk, A. E. Miroschnichenko and M. V. Fistul, ”Broken symmetries and directed collective energy transport”, Phys. Rev. Lett. **88**, 184101 (2002).

56. M. V. Fistul, A. E. Miroschnichenko, S. Flach, M. Schuster and A. V. Ustinov, ”Incommensurate dynamics of resonant breathers in Josephson junction ladders”, Phys. Rev. B **65**, 174524 (2002).

57. M. V. Fistul, ”Macroscopic quantum effects in the resistive states of Josephson coupled systems”, Phys. Stat. Sol, **233**, 497 (2002).

58. E. Il’ichev, M. Grajcar, T. Wagner, D. Born, L. Fritzsche, J. Kunert, V. Schultze, T. May, W. Krech, H. E. Hoenig, H.-G. Meyer, and M. V. Fistul, ”Characterization of superconducting structures designed for qubit realizations”, Applied Physics Letters, **80**, 4184 (2002).

59. S. Flach, A. E. Miroschnichenko, and M. V. Fistul, ”Wave scattering by discrete breathers”, cond-mat/0209427, Chaos, **13**, 596 (2003).

60. M. V. Fistul, ”Resonant breather states in Josephson coupled systems”, review article, Chaos, **13**, 725-732 (2003)

61. S. Flach, A. E. Miroschnichenko, V. Fleurov, and M. V. Fistul, ”Fano resonances with discrete breathers”, Phys. Rev. Lett., **90**, 084101 (2003).

62. A. Wallraff, A. Lukashenko, J. Lisenfeld, A. Kemp, M. V. Fistul, Y. Koval, and A. V. Ustinov, ”Quantum tunneling and energy level quantization of a Josephson vortex”, Nature, **425**, 155 (2003).

63. M. V. Fistul, A. Wallraff, and A. V. Ustinov, ”Quantum escape of the phase in a strongly driven Josephson junction”, Phys. Rev. B, **68**, 060504(R) (2003).

64. L.M. Floría, P.J. Martínez, S. Flach, and M. V. Fistul, ”Directed transport of modulated structures in the Frenkel-Kontorova model with a pulsating coupling”, Physica D, **187**, 100 (2004).

65. M. V. Fistul, A. E. Miroschnichenko, S. Flach, ”ac field-induced quantum rectification effect in tunnel junctions”, Phys. Rev. B, **68**, 153107 (2003) .

66. M. V. Fistul and A. V. Ustinov, ”Josephson vortex interaction mediated by cavity modes: Tunable coupling for superconducting qubits”, Phys. Rev. B, **68**, 132509 (2003).

67. M. V. Fistul, A. Wallraff, Y. Koval, A. Lukashenko, B. A. Malomed, and A. V. Ustinov, ”Quantum dissociation of a vortex-antivortex pair in a long Josephson junction”, Phys. Rev. Lett., **91**, 25704 (2003).

68. Y. Koval, M. V. Fistul, and A. V. Ustinov, "Enhancement of Josephson phase diffusion by microwaves", *Phys. Rev. Lett.*, **93**, 087004 (2004).
69. F. L. Barkov, M. V. Fistul, and A. V. Ustinov, "Microwave-induced flow of vortices in long Josephson junctions", *Phys. Rev. B*, **70**, 134515 (2004).
70. A. Kemp, M.V. Fistul, A. Wallraff, Y. Koval, A. Lukashenko, B.A. Malomed, and A.V. Ustinov, "Energy Level Spectroscopy of a Bound Vortex-Antivortex Pair", published in *Quantum Computation: Solid State Systems* (P. Delsing, C. Granata, Y. Pashkin, B. Ruggiero and P. Silvestrini Eds.) Kluwer Academic Plenum Publishers, (2004)
71. M. I. Dykman and M. V. Fistul, "Multiphoton antiresonance", *Phys. Rev. B* **71**, 140508(R) (2005).
72. A. E. Miroschnichenko, M. Schuster, S. Flach, M. V. Fistul, A.V. Ustinov, "Resonant plasmon scattering by discrete breathers in Josephson junction ladders", *Phys. Rev. B*, **71**, 174306 (2005).
73. A. A. Abdumalikov, Jr., M. V. Fistul, and A. V. Ustinov, "Vortex radiation in long narrow Josephson junctions: Theory and experiment", *Phys. Rev. B* **72**, 144526 (2005).
74. Y. Koval, M. V. Fistul, and A. V. Ustinov, "Tuning of phase diffusion in small Josephson junctions by magnetic field", *Phys. Rev. B* **73**, 212505 (2006).
75. A. M. Kadigrobov, M. V. Fistul, and K. B. Efetov, "Magnetotransport along a barrier: Multiple quantum interference of edge states", *Phys. Rev. B* **73**, 235313 (2006).
76. M. V. Fistul, "Macroscopic quantum tunneling in globally coupled series arrays of Josephson junctions", *Phys. Rev. B* **75**, 014502 (2007).
77. M. V. Fistul and A. V. Ustinov, "Quantum cavity modes in spatially extended Josephson systems", *Phys. Rev. B* **75**, 214506 (2007).
78. M. V. Fistul and K. B. Efetov, "Electromagnetic-Field-Induced Suppression of Transport through n-p Junctions in Graphene", *Phys. Rev. Lett.* **98**, 256803 (2007).
79. M. V. Fistul and K. B. Efetov, "Photon-assisted spin transport in a two-dimensional electron gas", *Phys. Rev. B* **76**, 195329 (2007).
80. M.V. Fistul, V.M. Vinokur, and T.I. Baturina, "Collective Cooper-Pair Transport in the Insulating State of Josephson-Junction Arrays", *Phys. Rev. Lett.* **100**, 086805 (2008).
81. V. M. Vinokur, T. I. Baturina, M. V. Fistul, A. Yu. Mironov, M. R. Baklanov, and Ch. Strunk, "Superinsulator and quantum synchronization", *Nature* **452**, 613 (2008).
82. S. V. Syzranov, M. V. Fistul, and K. B. Efetov, "Effect of radiation on transport in graphene", *Phys. Rev. B* **78**, 045407 (2008).
83. M. V. Fistul, V. M. Vinokur, and T. I. Baturina Reply, *Phys. Rev. Lett.* **102**, 049702 (2009).
84. M. P. Lisitskiy and M. V. Fistul, "Fiske steps and Abrikosov vortices in Josephson tunnel junctions", *Phys. Rev. B* **81**, 184505 (2010).
85. M. V. Fistul, S. V. Syzranov, A. M. Kadigrobov, and K. B. Efetov, "Radiation-induced quantum interference in low-dimensional n-p junctions", *Phys. Rev. B* **82**, 121409(R) (2010).
86. Y. Koval, M.V. Fistul, and A.V. Ustinov, "Incoherent microwave-induced resistive

states of small Josephson junctions”, *Fizika Nizkich Temperatur*, **36**, 1184 (2010).

87. K. G. Fedorov, M. V. Fistul, and A. V. Ustinov, ”Pinning of charge and flux solitons in disordered Josephson junction arrays”, *Phys. Rev. B* **84**, 014526 (2011).

88. A. Turchanin, D. Weber, M. Benfeld, C. Kisielowski, M.V. Fistul, K.B. Efetov, T. Weimann, R. Stosch, A. Glzhuser, ”Conversion of Self-Assembled Monolayers into Nanocrystalline Graphene: Structure and Electric Transport”, *ACS Nano.*, **5** (5), 38963904 (2011).

89. S. I. Mukhin and M. V. Fistul, ”Generation of non-classical photon states in superconducting quantum metamaterials” (Focus on Superconducting Metamaterials), *Supercond. Sci. Technol.*, **26** 084003 (2013).

90. J.-S. Kim, M. Klauui, M. V. Fistul, J. Yoon, C.-Y. You, R. Mattheis, C. Ulysse and G. Faini, ”Double resonance response in nonlinear magnetic vortex dynamics”, *Phys. Rev. B* **88**, 064402 (2013).

91. N. Maleeva, M. V. Fistul, A. Karpov, A. P. Zhuravel, A. Averkin, P. Jung, and A. V. Ustinov, ”Electrodynamics of a ring-shaped spiral resonator”, *J. Appl. Phys.* **115**, 064910 (2014).

92. P. A. Volkov, and M. V. Fistul, ”Collective quantum coherent oscillations in a globally coupled array of superconducting qubits”, *Phys. Rev. B* **89**, 054507 (2014).

93. P. Jung, S. Butz, M. Marthaler, M. V. Fistul, J. Leppakangas, V. P. Koshelets, and A. V. Ustinov, ”Multistability and switching in a superconducting metamaterial”, *Nat. Comm.* **5**, 3730 (2014).

94. M. V. Fistul, and K. B. Efetov, ”Radiation-induced quantum Fano-type resonances in the transport of n-p-n graphene-based junctions”, *Phys. Rev. B* **90**, 125416 (2014).

95. M. V. Fistul, N. Maleeva, M. V. Fistul, A. Karpov, A. P. Zhuravel, A. Averkin, P. Jung, and A. V. Ustinov, ”Electrodynamics of a planar Archimedean spiral resonator”, *Journal of Applied Physics*, **118**, 033902 (2015).

96. M.V. Fistul, ”Resonant enhancement of macroscopic quantum tunneling in Josephson junctions: Influence of coherent two-level systems”, *Phys. Rev. B* **92**, 014505 (2015).

97. A. M. Kadigrobov and M V Fistul, Bound states induced giant oscillations of the conductance in the quantum Hall regime, *Journal of Physics: Condensed Matter*, **28**, 255301 (2016)

98. M. V. Fistul, ”Josephson phase diffusion in small Josephson junctions: a strongly nonlinear regime”, published by Edizioni della Normale (Pisa, Italy) in a volume in honor of Gabriele F. Giuliani edited by M. Polini, G. Vignale, V. Pellegrini, and J.K. Jain

99. N. Kalugin, Nikolai, L. Jing, M. Suarez, G. Dyer, L. Wickey, M. Ovezmyradov, A. Grine, M. Wanke, E. Shaner, Lau Chun Ning; L. Foa Torres, M. V. Fistul, and K. B. Efetov, ”Photoelectric polarization-sensitive broadband photoresponse from interface junction states in graphene”, *2D Mater.* **4** (2017) 015002.

100. M. A. Iontsev, S. I. Mukhin, and M. V. Fistul, Double resonance response of a superconducting quantum metamaterial: manifestation of non-classical states of photons, *Phys. Rev. B* **94**, 174510 (2016).

101. M. V. Fistul, Quantum synchronization in disordered superconducting metama-

terials, Scientific Reports **7**, 43657 (2017)

102. K. Shulga, P. Yang, G. P. Feodorov, M. V. Fistul, M. Vaides, A. V. Ustinov, "Observation of the collective mode in the array of transmon-qubits, JETP Letters , **105**, 38 (2017).

103. I. Vakulchyk, M. V. Fistul, P. Qin, and S. Flach, Anderson localization in generalized discrete time quantum walks, Phys. Rev. B **96**, 144204 ( 2017).

104. K. V. Shulga, E. Il'ichev, M. V. Fistul, I. S. Besedin, S. Butz, O. V. Astafiev, U. Huebner and A. V. Ustinov, "Magnetically induced transparency of a quantum metamaterial composed of twin flux qubits", Nat. Comm. **9**, 150 (2018)

105. M. P. Lisitskiy, J. Lisenfeld, M.V. Fistul and A.V. Ustinov, NbN based superconducting Josephson phase qubit with AlN tunnel barrier, IEEE Xplore proceedings (ISEC 2017).

106. M. V. Fistul, I. Vakulchyk, P. Qin and S. Flach, Anderson localization in a discrete time quantum walk: interplay of dispersion and disorder, AIP Conference Proceedings 1936 020023 ( 2018).

107. V. M. Kovalev, Wang-Kong Tse, M. V. Fistul, and I. G. Savenko, Valley Hall Transport of Photon-Dressed Quasiparticles in 2D Dirac Semiconductors, New J. Phys. **20** , 083007 (2018)

108. N. Maleeva, L. Grnhaupt, T. Klein, F. Levy-Bertrand, O. Dupr, M. Calvo, F. Valenti, P. Winkel, F. Friedrich, W. Wernsdorfer, A. V. Ustinov, H. Rotzinger, A. Monfardini, M. V. Fistul, and I. M. Pop, Circuit Quantum Electrodynamics of Granular Aluminum Resonators, Nature Communications, **9** 3889 (2018).

109.I. Vakulchyk, M. V. Fistul, Y. Zolotaryuk, and S. Flach, "Almost compact moving breathers with fine-tuned discrete time quantum walks, Chaos: An Interdisciplinary Journal of Nonlinear Science, **28**, 23104 (2018),

110. Ihor Vakulchyk, Mikhail V. Fistul, and Sergej Flach, Wave Packet Spreading with Disordered Nonlinear Discrete-Time Quantum Walks, Phys. Rev. Lett. **122**, 040501 (2019).

111. A. Andreanov and M. V. Fistul, Resonant frequencies and spatial correlations in frustrated arrays of Josephson type nonlinear oscillators, J. Phys. A: Math. Theor. **52**, 105101 (2019).